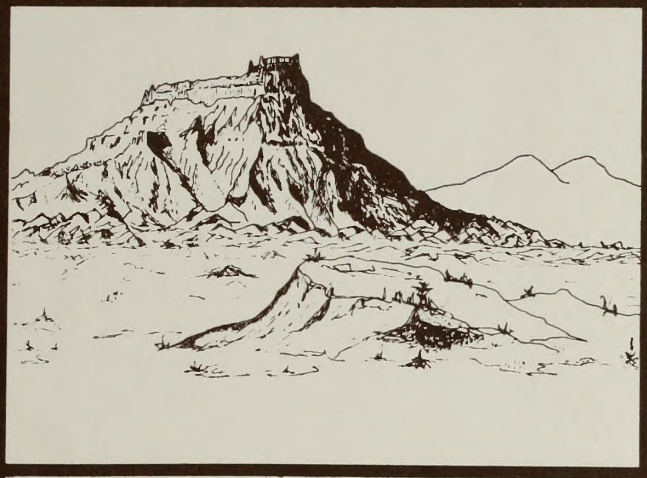
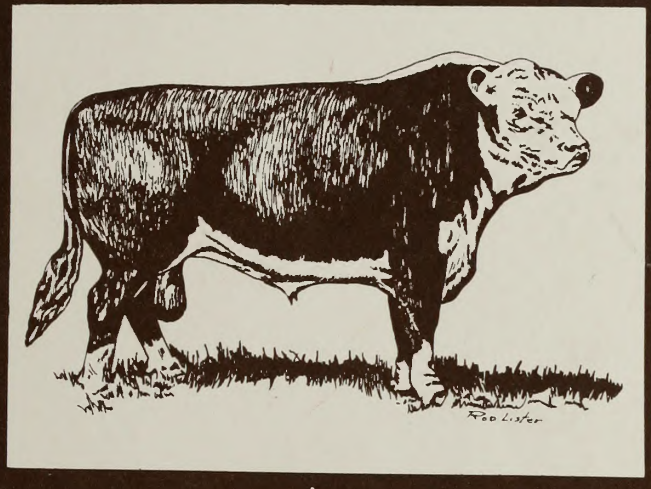
# DRAFT
# HENRY MOUNTAIN GRAZING



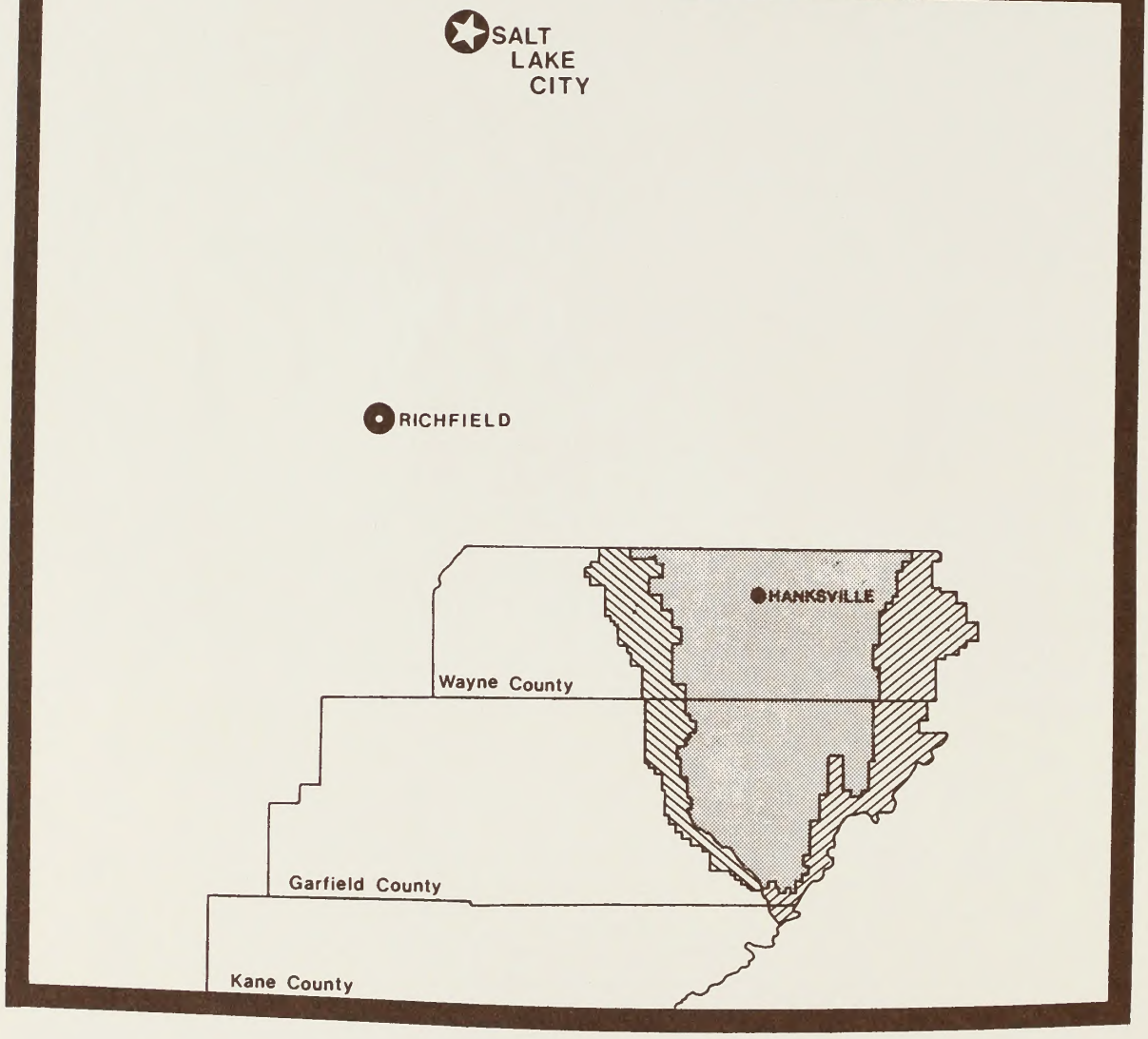


# ENVIRONMENTAL IMPACT STATEMENT

RICHFIELD DISTRICT
BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF INTERIOR
OCTOBER, 1982

# UTAH

## HENRY MOUNTAIN PLANNING AREA




ON THE COVER: One of the last wild and free-roaming bison herds in the United States graze together with domestic cattle in the Henry Mountains. Their natural environment is illustrated by Factory Butte, a prominent landmark near Hanksville. Also drawn is the historic Wolverton Mill, constructed near Mt. Pennell about 1918.

Cover illustrations by Rod Lister; design by Ed Bovy. Text wildlife illustrations by Rod Lister and Susan Lowe. Plant illustrations courtesy of Jennifer Shoemaker.

# HENRY MOUNTAIN GRAZING

# DRAFT

# ENVIRONMENTAL IMPACT STATEMENT

Prepared by
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RICHFIELD DISTRICT

Roland Robinson

State Director
Utah State Office

Abstract: The Bureau of Land Management proposes to update and revise the grazing management program within the Henry Mountain Planning Area. The program would provide vegetation to livestock, big game, and wild burros. The alternatives included in this environmental impact statement recommend levels of livestock grazing, identify needed rangeland improvements, and outline a schedule of implementation. Measures to protect or enhance environmental resources have been incorporated into the program. Alternatives considered in addition to (A) Proposed Action: No Change--Permit Livestock/Big Game Grazing at Current Average Levels of Use, include: (B) No Action--Maintain Existing Forage Allocation; (C) Manage for Optimum Big Game Production; (D) Manage for Optimum Livestock Production; and (E) Preferred Alternative--Management Framework Plan Step 2 Planning Recommendation. A concise description of the affected environment and an analysis of the environmental consequences resulting from each alternative are included in the document.

For Further Information Contact: Dee R. Ritchie, EIS Team Leader, Richfield District Office, Bureau of Land Management, 150 East 900 North, Richfield, Utah 84701, or call (801) 896-8221.

Comments on the Draft EIS are Due: December 30, 1982

# LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE DRAFT EIS WILL BE SENT

**BLM will request comments on the Draft EIS from all affected grazing permittees, interested individuals, and the following agencies and interest groups:**

## Federal Agencies

- Department of Agriculture
  - Agricultural Stabilization and Conservation Service
  - Forest Service
  - Soil Conservation Service
- Department of the Interior
  - Geological Survey
  - Fish and Wildlife Service
  - Bureau of Mines
  - Bureau of Reclamation
  - National Park Service
    - Canyonlands National Park
    - Capitol Reef National Park
    - Glen Canyon National Recreation Area
- Office of the Solicitor
- Department of Commerce
- Advisory Council on Historic Preservation
- Environmental Protection Agency

## Utah State Agencies

- State of Utah
  - Clearinghouse
  - Department of Natural Resources
  - Division of Water Resources
  - Division of Wildlife Resources
  - Division of Lands
  - Division of Oil, Gas, and Mining
- University of Utah
- Utah State University

## Local Agencies

- Six County Organization
- Five County Organization
- Garfield County Commission
- Kane County Commission
- Wayne County Commission

## Nongovernment Organizations

- Audubon Society
- Brigham Young University
- Common Cause
- Council on Utah Resources
- Defenders of the Outdoor Heritage
- Defenders of Wildlife
- Friends of the Earth
- League of Women Voters
- National Council of Public Land Users
- National Parks and Recreation Association
- National Stock Growers' Association
- National Wildlife Federation
- National Woolgrowers' Association
- Natural Resources Defense Council
- Nature Conservancy
- Pro-Utah Inc.
- Public Lands Council
- Save Our Canyons Committee
- Sierra Club
- Slick Rock County Council
- Society for Range Management
- Source
- The Wilderness Society
- The Wildlife Society
- Utah Cattlemen's Association
- Utah Council, Trout Unlimited
- Utah Farm Bureau
- Utah Sportsmen Association
- Utah Archaeological Society
- Utah Gem and Mineral Society
- Utah Water Pollution Control Association
- Utah Wilderness Association
- Utah Wildlife and Outdoor Recreation Federation
- Utah Woolgrowers' Association
- Wild and Scenic Rivers

## Congressional

- Utah Delegation

## Interested/Affected Individuals

- Permittees
- Private Landowners

## EIS Availability

**Copies of this Draft EIS will be available for public inspection at the BLM offices listed below:**

Washington Office of Public Affairs
18th and C Street, N.W.
Washington, D.C. 20240

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Salt Lake City, Utah 84111
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Richfield District Office
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Richfield, Utah 84701
Phone: (801) 896-8221

Henry Mountain Resource Area
Hanksville, Utah 84734
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# SUMMARY

## INTRODUCTION

The five alternatives were developed as part of the management framework plan (MFP) update and as part of the Bureau of Land Management-Natural Resources Defense Council schedule. The Rangeland Program Summary on this action will be issued in the spring of 1983 following public involvement.

The purpose of the action is to review, update, and revise the grazing management program in the Henry Mountain Planning Area. The objective of the program is to maintain and/or enhance vegetation, livestock grazing, recreation, wildlife, and watershed resources.

The Henry Mountain Planning Area is part of the Henry Mountain Resource Area, which is administered by the Bureau of Land Management (BLM) office at Hanksville, Utah. The planning area is located in southeastern Utah on the Colorado Plateau. It is bordered on the north by the Wayne-Emery County line, on the west by Capitol Reef National Park, and on the south and east by the Colorado River and Canyonlands National Park. The Henry Mountain Resource Area administers grazing on 1.9 million acres: of these, 69 percent are BLM, 21 percent are National Park and National Recreation Areas (NRA); 9 percent are State; and 1 percent are private.

Elevation in the planning area ranges from 3,700 feet at Lake Powell to 11,615 feet on Mt. Ellen. Annual precipitation varies from less than 5 inches at Hanksville to more than 30 inches in the Henry Mountains. The area contains both mountain and desert life forms. The diverse vegetation ranges from Douglas fir, Gambels oak, and sagebrush in the mountains and foothills to shadscale and blackbrush below 6,000 feet.

Area uses include livestock grazing, mining, oil and gas exploration, hunting, camping, sightseeing, hiking, and off-road vehicle (ORV) use. The local economy relates directly to these uses. The area provides yearlong habitat for deer, bison, antelope, bighorn sheep, wild burros, and small and non-game species.

## THE PLANNING PROCESS

The planning documents were updated in 1980-82 in accordance with BLM Manuals 1601-1608. The planning system's MFP Step 2 Recommendation and other alternatives analyzed in this environmental impact statement (EIS) evolved through the BLM's interdisciplinary planning process.

During the planning process, the 22 grazing allotments were grouped into three categories based on habitat condition and trend, potential for improvement, resource use conflicts, positive return on investments, and effectiveness of present management. These categories are:

| Category | Allotments | Percent of Planning Area |
|---|---|---|
| Maintain | 7 | 36 |
| Improve | 11 | 36 |
| Custodial | 4 | 17 |

Five allotments (11 percent of the planning area) are unallotted for livestock grazing.

## SCOPING AND AREAS OF CONTROVERSY

The scoping of issues was initiated in May 1978 and updated and revised in May 1980 when the preplanning analysis session was held. The Notice of Intent to prepare an EIS was placed in the *Federal Register* in July 1981. Meetings were held on August 25 and 26, 1981 to solicit public issues and concerns.

The most controversial issue arising in the meetings and in other discussions with individuals was forage use by bison, deer, wild burros, and livestock. Other important issues included the amount and kind of rangeland improvements needed to meet present and future needs; oil, gas, and mineral development; and land use conflicts such as urban (town site) and recreation developments in important areas of livestock and wildlife use. The social and economic impacts to the livestock industry resulting from changes in allotment use were also addressed.

## ALTERNATIVES ANALYZED

The alternatives analyzed were developed from the multiple-use recommendations in the MFP Step 2, specialists' recommendations in the MFP Step 1, and the existing situation. Resolution of conflicts between resources was used as a basis for developing the MFP Step 2 Planning Recommendation Alternative.

The alternatives analyzed are (A) Proposed Action: No Change—Permit Livestock/Big Game Grazing at Current Average Levels of Use; (B) No Action—Maintain Existing Forage Allocation; (C) Manage for Optimum Big Game Production; (D) Manage for Optimum Livestock Production; and (E) Preferred Alternative—MFP Step 2 Planning Recommendation.

The levels of livestock and big game use that are analyzed under each alternative are shown in Summary Table 1 and Figure 1.

TABLE 1

Alternative Comparisons

| | Current Use | Proposed Use (AUMs) Alternatives A | B | C | D | E |
|---|---|---|---|---|---|---|
| Livestock[a] | | | | | | |
| Cattle | 26,330 | 26,330 | 50,678 | 35,722 | 46,677 | 42,006 |
| Sheep | 301 | 301 | 5,607 | 4,082 | 12,851 | 8,481 |
| Subtotal | 26,631 | 26,631 | 56,285 | 39,804 | 59,528 | 50,487 |
| Wildlife | | | | | | |
| Bison | 2,696 | 2,696 | 2,400 | 3,768 | 0 | 2,088 |
| Deer | 2,246 | 2,246 | 4,800 | 6,127 | 2,323 | 5,641 |
| Antelope | 87 | 87 | 0 | 960 | 87 | 695 |
| Bighorn Sheep | 75 | 75 | 0 | 3,968 | 2,336 | 3,930 |
| Burros | 100 | 100 | 100 | 100 | 100 | 100 |
| Subtotal | 5,204 | 5,204 | 7,300 | 14,923 | 4,846 | 12,454 |
| Total | 31,835 | 31,835 | 63,585 | 54,727 | 64,374 | 62,941 |
| Rangeland Improvements[b] | | | | | | |
| Land Treatments (acres) | | | | 23,950 | 23,950 | 23,950 |
| Primary Value for Livestock (acres) | | | | 4,862 | 19,650 | 19,650 |
| Primary Value for Big Game (acres) | | | | 19,088 | 3,000 | 4,300 |
| Springs (each | | | | 18 | 18 | 18 |
| Reservoirs (each) | | | | 119 | 119 | 119 |
| Pipelines (miles) | | | | 31 | 31 | 31 |
| Troughs (each) | | | | 41 | 41 | 41 |
| Vertical Wells (each) | | | | 6 | 6 | 6 |
| Horizontal Wells (each) | | | | 2 | 2 | 2 |
| Corral (each) | | | | 1 | 1 | 1 |
| Fence (miles) | | | | 16 | 16 | 16 |
| Cattle Guards (each) | | | | 2 | 2 | 2 |
| Big Game AUMs From Improvements | | | | 2,440 | 160 | 560 |
| Livestock AUMs From Improvements | | | | 555 | 2,835 | 2,435 |

Source: Tables 2-2 and 2-4.

[a]BLM and NRA lands only; figures not included for Capital Reef National Park. No alternative would affect preference or average licensed use on Capital Reef National Park.

[b]No rangeland improvements proposed under Alternatives A or B.

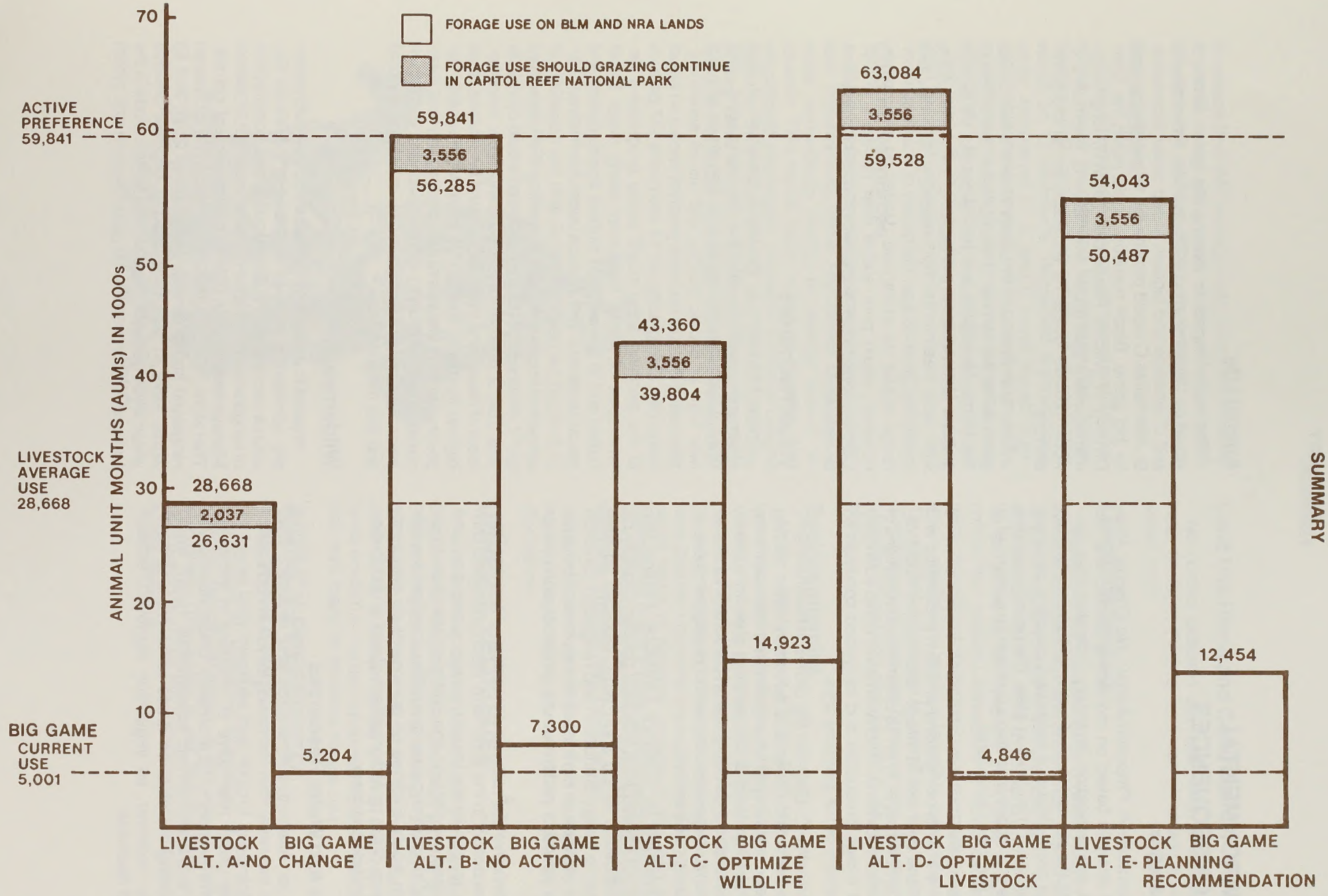



FIGURE 1

**FORAGE USE BY ALTERNATIVE**

# ENVIRONMENTAL CONSEQUENCES

## Vegetation

*Alternative A: Proposed Action—No Change*: Allotment analysis based on monitoring studies and the 1980 soil-vegetation inventory indicates that continuing the present level of use would adversely affect forage production and rangeland condition on about 18 percent of the planning area. The period or pattern of use or distribution is also a problem on portions of at least five other allotments.

*Alternative B: No Action*: The level of use that would occur with livestock grazing at active preference and bison and deer use at forage reservations would exceed grazing capacity on 18 allotments and portions of four other allotments. This alternative could adversely affect forage production and rangeland condition on 56 percent of the planning area.

*Alternative C: Optimize Big Game*: In the short term, bison use would continue to adversely affect grazing capacity and rangeland condition on one allotment, less than 1 percent of the planning area. In addition, overutilization would continue on portions of four other allotments because of the period or pattern of use or distribution of livestock.

*Alternative D: Optimize Livestock*: Forage use would not exceed total indicated grazing capacity on any allotment. In the short term, localized adverse impacts to forage production and rangeland condition would continue on portions of five allotments because of the period or pattern of use or distribution of livestock.

*Alternative E: Preferred Alternative—Planning Recommendation*: In the short term, bison use would continue to adversely impact forage production and rangeland condition on one allotment, less than 1 percent of the planning area. In addition, localized overutilization would continue on portions of six allotments because of the period or pattern of use or distribution of livestock and bison.

## Soils and Water Resources

Under Alternative A, erosion and sediment yield would increase, thus increasing runoff on portions of 12 allotments. Erosion and sediment yield would increase under Alternative B, resulting in increased runoff on portions of 22 allotments. Under Alternatives C, D, and E erosion and subsequently, runoff, would temporarily increase on areas receiving land treatments; however, as vegetation improved, erosion would decrease.

## Animal Life

The major impact to existing big game numbers would be the elimination of bison under Alternative D and of antelope and bighorn sheep under Alternative B. Alternative C would provide the largest forage use for big game. Bison numbers could reach the Utah Division of Wildlife Resources' (UDWR) long-range management goal under Alternative C. Alternative E would provide forage for increases for all big game animals.

The major finding in the analysis of impacts to big game is that the summer diets for deer and antelope in the Henry Mountains are probably not nutritionally suitable for increased production. In the long term, with land treatments/improvements favoring high quality big game forage, the quality of crucial summer range would be enhanced. Under no alternative, however, could prior stable deer numbers and/or UDWR's long range management goals for antelope be obtained.

## Visual Resources

Under Alternative A, the visual resources on four allotments would be affected by overgrazing, and VRM objectives might not be met. The areas affected rate high in scenic quality and visual sensitivity. Alternative B would have the greatest impact on visual resources. Overgrazing on 14 allotments (47 percent of the planning area) could cause progressive deterioration of visual resources along major travel routes and in the areas of highest scenic quality and visual sensitivity. The impacts under Alternatives C, D, or E would be nearly identical, with the possibility of rangeland improvements not meeting VRM objectives on 17 allotments. The areas affected would constitute less than 2 percent of the planning area; however, most of these land treatments would be in areas rated highest in scenic quality (Mt. Ellen/Mt. Pennell). Recovery from the impacts of overgrazing and land treatments could take up to several decades in Class II areas. The impacts from reservoir construction would last into the long term.

## Wilderness

Impacts to wilderness resource values would generally correspond to those identified in the Visual Resource section above. Overgrazing and construction of rangeland improvements could violate BLM Interim Management Policy (IMP) non-impairment criteria. Therefore, construction of some of the proposed rangeland improvements (Alternatives C, D, and E) would have to be delayed until Congress decides which wilderness study areas (WSAs) to include in the National Wilderness Preservation System and which

to release from IMP management. Under Alternatives A and B, overgrazing could violate non-impairment criteria in two and five WSAs, respectively.

### Recreation

Under Alternative A, recreation values on four allotments would be affected by overgrazing. Under Alternative B, overgrazing would affect recreation values on 12 allotments. Rangeland improvements under Alternatives C, D, and E would impact sightseeing and primitive values. Improvements in wildlife habitat under Alternatives C and E would improve hunting for big game. Elimination of the bison herd under Alternative D would significantly affect hunting and sightseeing values.

### Cultural Resources

Ground disturbance during construction of rangeland improvements under Alternatives C, D, and E could inadvertently destroy or damage cultural resources. This would result in loss of scientific and educational information. However, intensive cultural resource inventories prior to any ground-disturbing actions could identify previously unknown sites and areas and increase knowledge of cultural resources.

### Land Use Plans and Controls

No conflict between any alternative and existing local, State, or Federal land use plans and controls would occur.

### Livestock Grazing

Alternative A (Proposed Action) would result in the greatest reduction to active preference. Alternatives A and B would both result in overgrazing, which violates BLM Manual 43 CFR 4110 regulations and could not be sustained by the livestock permittees in today's competitive system. Alternative C would cause the most disruption to individual permittees. Alternative D would result in the greatest benefit to permittees, with the greatest advantage to permittees having sheep. Considering multiple-use management, Alternative E provides a relatively high benefit to livestock permittees.

### Socioeconomics

Under Alternatives A, C, D, and E, with the exception of reductions in permits and, thus, in ranch capital values, impacts to permittees and the regional economy are positive. Alternative B, which would result in the most overgrazing of any of the alternatives, could have positive economic impacts in the short term, but would result in negative impacts in the long term. Alternatives D and E have positive economic impacts for permittees and the region without causing negative economic impacts from overgrazing.

Regional economic impacts from changes in hunting would be less than plus or minus 1 percent in all alternatives.

## UNRESOLVED ISSUES

Portions of five allotments fall within the boundary of Capitol Reef National Park. Livestock grazing on the Park is being phased out. However, a Senate Bill has been introduced that would permit livestock grazing to continue for a certain period of time. National Park lands would have to be inventoried before a final decision was made on livestock forage use.

## AGENCY-PREFERRED ALTERNATIVE

Alternative E, Preferred Alternative—MFP Step 2 Planning Recommendation, is the agency-preferred alternative. This choice is not final because public input during the Draft EIS comment period could modify this selection.

# CHAPTER 1
# PURPOSE AND NEED FOR ACTION

## INTRODUCTION

The Henry Mountain Planning Area is part of the Henry Mountain Resource Area, which is administered by the Bureau of Land Management (BLM) office at Hanksville, Utah. The planning area is located in southeastern Utah in the Colorado Plateau area (see Figure 1-1). It is bordered on the north by the Wayne-Emery County line, on the west by Capitol Reef National Park, and on the south and east by the Colorado River and Canyonlands National Park. (See Table 1-1 for land ownership.) Elevation ranges from 3,700 feet at Bullfrog to 11,615 feet on Mount Ellen. Annual precipitation varies from less than 5 inches at Hanksville to more than 30 inches in the Henry Mountains. The area contains both mountain and desert life forms. The diverse vegetation ranges from Douglas fir, Gambels oak, and sagebrush in the mountains and foothills to desert shrub (shadscale, blackbrush) below 6,000 feet.

Major land uses include livestock grazing, uranium mining, and oil and gas exploration. Recreation use involves hunting, camping, sightseeing, hiking, and off-road vehicle (ORV) use. The area provides year-long habitat for deer, bison, antelope, bighorn sheep, and other small and non-game species. The local economy relates directly to the major land uses.

The administration of livestock grazing is handled through grazing allotments and a livestock permit system. There are 22 allotments with proposed forage use levels for livestock and big game grazing (see Figure 1-2). Administration of allotments which cross district boundaries (see Figure 1-1) is based upon an agreement between the Richfield and Moab Districts.

Total acreage for all allotments analyzed in this environmental impact statement (EIS) differs from that of the planning area because of the interdistrict allotment management agreement. There is a total of 1,893,272 acres analyzed, including grazing allotments and unallotted areas. Five allotments, comprising 199,856 acres (10.6 percent of the area), are not allotted for livestock grazing.

## PURPOSE AND NEED

The purpose of the action—the updating and revising of the grazing management program—is to maintain or improve public land resources such as soil, water, and vegetation through the use of grazing management. As required by law (Taylor Grazing Act, 1934; Classification and Multiple Use Act, Public Law 88-6071, 1964; and the Federal Land Policy and Management Act of 1976), BLM is responsible for management "in a manner that will protect the land and its resources from destruction or unnecessary injury, stabilize the livestock industry dependent on public lands, and provide for the orderly use, improvement, development, and rehabilitation of the public lands for livestock grazing consistent with multiple use, sustained yield, environmental, economic, and other objectives" (BLM Manual 4100.0-2).

This EIS was also prepared in response to a suit filed in Federal court in 1973 by the National Resources Defense Council et al., which alleged that BLM's programmatic grazing EIS did not comply with the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.). The court ruled that BLM would prepare site-specific EISs for all public lands where grazing authorization is a major Federal action significantly affecting the quality of human environment.

The soil-vegetation inventory conducted during 1978-80 and monitoring studies conducted for more than 10 years indicate that grazing use on some allotments may exceed forage production. Conversely, some allotments have the potential for additional grazing use through modification of current grazing systems and/or rangeland improvements. Other allotments are in good condition under present management.

## OBJECTIVE OF THE GRAZING MANAGEMENT PROGRAM

The objective of the grazing management program is to maintain and improve rangeland conditions and implement grazing use levels for livestock and big game which do not exceed the rangeland's indicated grazing capacity.

The program involves authorizing and supervising livestock grazing; providing forage for big game; developing, maintaining, and improving wildlife habitat; managing livestock and rangeland improvements; and protecting rangeland from human-caused and natural abuses.

All legally protected resources (i.e., threatened and endangered species, wild horses and burros, and cultural resources) will be considered during development of this grazing management program.

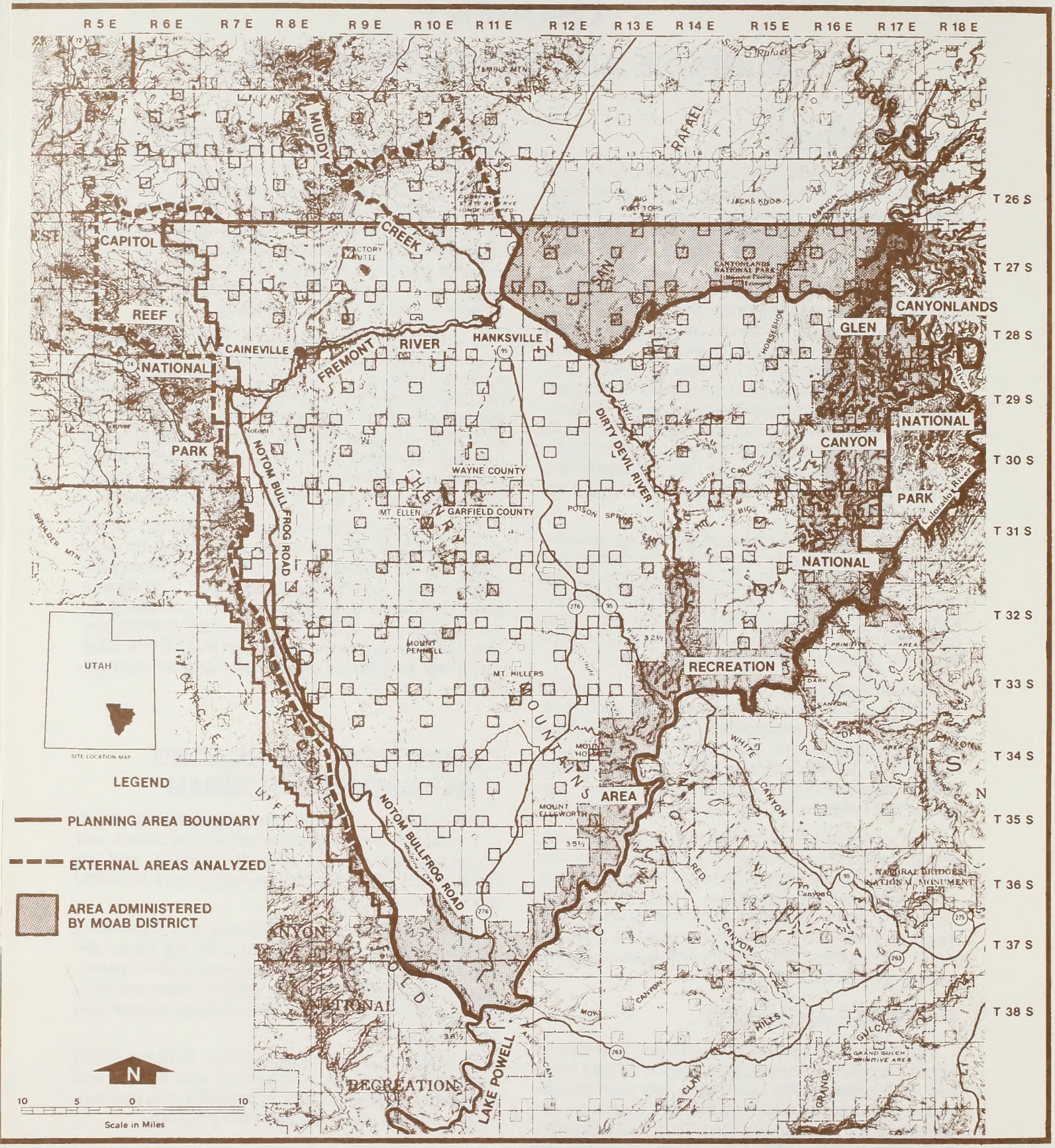



FIGURE 1-1

## HENRY MOUNTAIN PLANNING AREA

TABLE 1-1

Land Ownership

| Ownership | Acres |
|---|---|
| Federal | |
| Public Lands (BLM Administered) | 1,312,021 |
| Glen Canyon National Recreation Area[a] | 265,965 |
| Capitol Reef National Park[a] | 126,755 |
| State | 172,995 |
| Private | 15,536 |
| Total | 1,893,272 |

Source: USDI, BLM, 1982.

[a]BLM administers the livestock grazing program in these areas.

TABLE 1-2

Classification of Allotments into M I C Categories

| M (Maintain) | I (Improve)[a] | C (Custodial) |
|---|---|---|
| Bullfrog | Nasty Flat | Cathedral |
| Burr Point | Pennell | Hartnet |
| Hanksville | Sandy 2 | Sandy 3 |
| North Bench | Sawmill Basin | Waterpocket |
| Robbers Roost | Crescent Creek | |
| Sewing Machine | Steele Butte | |
| Wild Horse | Rockies | |
| | Trachyte | |
| (Unallotted Areas) | Cedar Point | |
| | Sandy 1 | |
| Dry Lakes | Blue Bench | |
| Flint Trail | | |
| Little Rockies | | |
| North Caineville Mesa | | |
| South Caineville Mesa | | |

Source: USDI, BLM, 1982.

[a]Allotments are in order of priority for implementation of rangeland improvements, subject to the availability of funds.

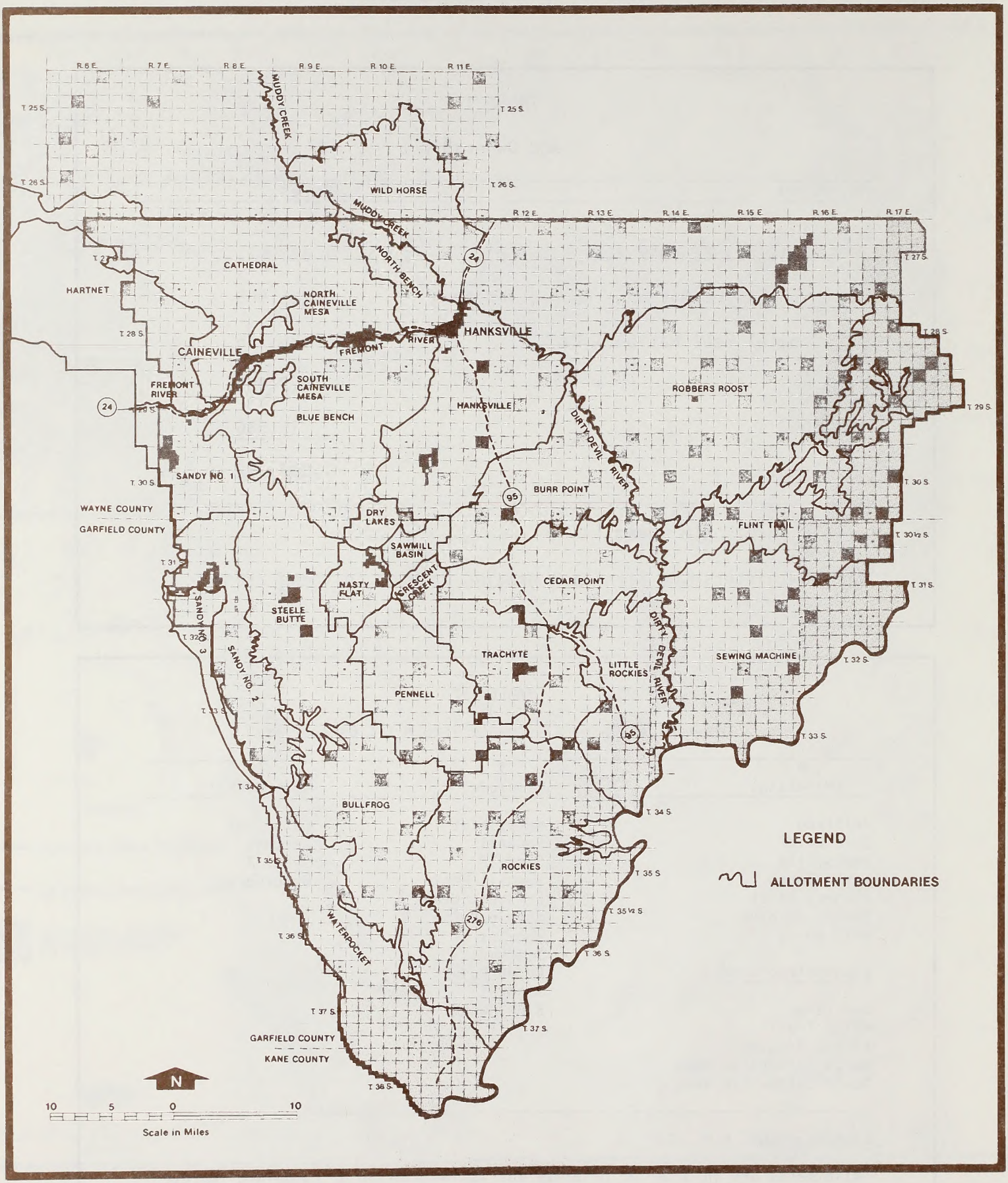



FIGURE 1-2
## GRAZING ALLOTMENTS

## THE PLANNING PROCESS

The planning documents were updated in 1980-81 in accordance with BLM Manuals 1601-1608. These manuals provide guidance for land use and resource allocation on public lands. The proposed action and alternatives analyzed in this EIS evolved through the BLM's planning process, as outlined in Figure 1-3. This EIS was prepared by an interdisciplinary team.

During the planning process, grazing allotments were grouped into three categories based on ecological condition and trend, potential for improvement, resource use conflicts, positive return on investments, and effectiveness of present management (see Table 1-2). These categories and objectives are:

*Category M (Maintain)*: No special management needs noted—allotments are in satisfactory condition and no major conflicts are evident. Permittees will be encouraged to invest in rangeland improvement projects which would enhance their use of the allotment.

*Category I (Improve)*: This category will receive first priority for rangeland improvements as funding becomes available. Special management actions are needed—major resource conflicts and/or other grazing problems exist, but allotments have potential for improved productivity and positive return on investments. Permittees will be encouraged to invest in rangeland improvement projects which would enhance their use of the allotments.

*Category C (Custodial)*: No special management actions feasible—allotments have no or limited improvement or investment potential. Present management appears satisfactory or is the only logical practice under existing resource conditions. Permittees will be encouraged to invest in rangeland improvement projects which would enhance their use of the allotment.

Allotments placed under one of the above categories can be shifted to another category if survey data, monitoring, public comment, or other pertinent facts warrant the change.

*Steps in BLM's Planning Process*

1. *Land and Resource Inventory Data* is collected on current resource supply and production, condition, and trend. Data is collected in the following land use categories: lands, minerals, forest products, rangeland management, watershed, wildlife habitat, recreation, and wilderness. Additional physical data, including topography, climate, geology, soils, vegetation, erosion condition, hazards, developments, and access are also collected.

2. An *Unit Resource Analysis* (URA), containing a summary of the resource inventories and a discussion of the physical profile (soils, geology, climate, etc.), is prepared next. This document also describes current land uses, forage production, trend, and condition. In addition, projections for potential resource enhancement, improvement, and production are developed.

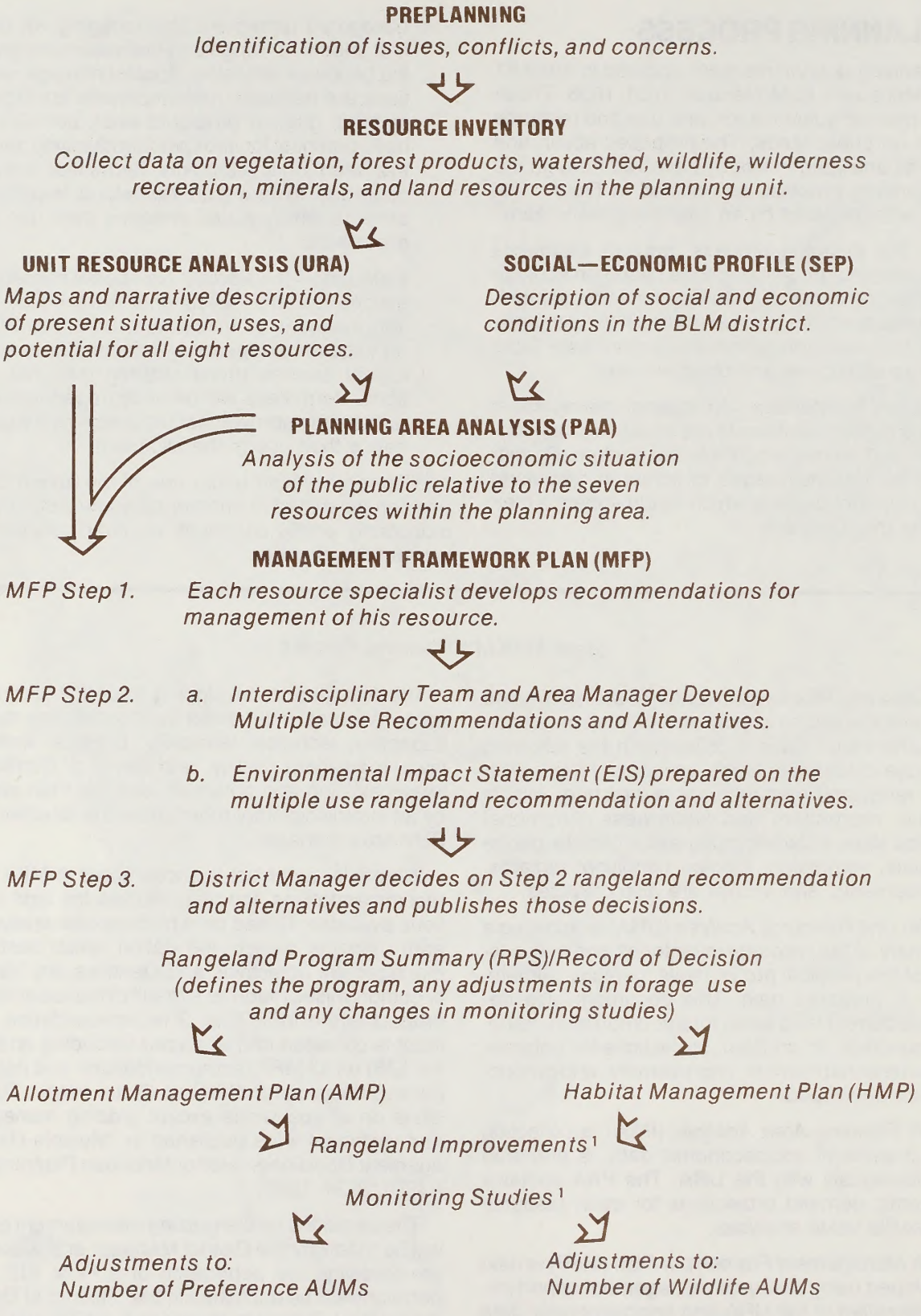
3. A *Planning Area Analysis* (PAA), a collection and analysis of socioeconomic data, is prepared simultaneously with the URA. The PAA contains economic demand projections for each resource and social value analyses.

4. A *Management Framework Plan* (MFP) is next developed using resource management opportunities identified in the URA and socioeconomic data presented in the PAA. It is organized around the eight categories listed in the Land and Resource Inventory section.

The first step in developing the MFP is to protect each resource independently, considering resource capability, technical feasibility, physical limitations, laws, regulations, policy, and demand. Conflicts between existing and potential uses are then identified by an interdisciplinary team under the direction of the BLM area manager.

Whenever a conflict is encountered in MFP Step 1 recommendations, the team studies the land use options available. Based on a multiple-use analysis, the area manager selects the option which best meets management objectives and identifies any trade-offs or compromises made as a result of that selection. The product is the MFP Step 2 recommendation. Public input is collected and analyzed (including analysis in the EIS) on all MFP recommendations and final multiple-use decisions (MFP Step 3) are made. The decisions on all resources except grazing management and wildrness were published in "Multiple-Use Management Decisions—Henry Mountain Planning Area" (USDI, BLM, 1982).

The decisions on the grazing management program will be made by the District Manager and Area Manager following the publication of a Final EIS. These decisions will be published in the "Record of Decision/Rangeland Program Summary" which will identify specific objectives, forage use, and rangeland improvement projects by allotment.




[1] *Dependent on legislative funding*

FIGURE 1-3

## BLM PLANNING PROCESS

## SCOPING

Scoping is the identification of issues, concerns, interrelationships, and possible alternative courses of action. Furthermore, it is a way for BLM to consult with affected or concerned parties. Significant issues are identified during this process.

Scoping began in 1978 when BLM specialists met to identify significant issues. These issues were refined in 1980 when BLM sent a public involvement guidebook to over 400 organizations and individuals. The Notice of Intent to prepare this EIS was published in the *Federal Register* in July 1981. Scoping meetings to solicit public concerns and issues to be analyzed in this EIS were held on August 25, 1981 in Hanksville and on August 26, 1981 in Salt Lake City.

The most important issue arising in the meetings and in other discussions was the proposed forage use by bison, deer, wild burros, and livestock. Some felt that livestock should be given more forage, while others felt that bison should receive more. Other important issues included the amount and kind of rangeland improvements needed to meet present and future needs, resolution of land use conflicts, and recreation use in critical or important areas of livestock and wildlife use. The social and economic impacts to the livestock industry resulting from changes in allotment use were also identified as concerns.

## ALTERNATIVES DISCUSSED

Five alternatives have been identified for discussion and analysis in this Draft EIS. Under Alternatives C, D, and E, use by livestock and big game would not exceed forage production as measured by the soil-vegetation inventory and monitoring studies. Alternative A is the proposed action, and Alternative E is the preferred alternative.

*Alternative A. Proposed Action: No Change—Permit Livestock/Big Game Grazing at Current Average Levels of Use.*

*Alternative B. No Action—Maintain Existing Forage Allocation.*

*Alternative C. Manage for Optimum Big Game Production.*

*Alternative D. Manage for Optimum Livestock Production.*

*Alternative E. Preferred Alternative—MFP Step 2 Planning Recommendation.*

## ALTERNATIVES DISMISSED

The elimination of livestock grazing was dismissed as an alternative because it did not meet the test of a reasonable alternative as directed by the Council on Environmental Quality Regulations (1978).

As noted in the Summary (Unresolved Issues section), the possibility of continued grazing in Capitol Reef National Park could be an alternative to the elimination of grazing there. However, this alternative was not evaluated in the Draft EIS because legislation is pending and further monitoring and study would be needed for proper analysis. Therefore, the alternatives discussed in this EIS presume the continued scheduled phase-out of livestock grazing in the Park. At present, the Sandy 1, 2, Waterpocket, Cathedral, and Hartnet Allotments straddle the Park boundary. The eventual phase-out of this grazing would eliminate 3,556 animal unit months (AUMs) of active preference on Federal lands in Capitol Reef National Park and 458 AUMs on State land.

## INTERRELATIONSHIPS WITH OTHER AGENCIES, GROUPS, AND INDIVIDUALS

BLM-administered lands in the Henry Mountain Resource Area are interspersed with private- and State-owned lands. Additionally, National Park Service administered lands adjoin the east and west perimeters of the planning area. This land ownership pattern makes close coordination necessary between land management agencies and private landowners to accomplish common goals and avoid resource use conflicts. Table 1-3 identifies interrelationships between the BLM rangeland management program and other groups and governmental agencies.

TABLE 1-3

Interrelationships of BLM Rangeland Management Program
and Other Groups and Governmental Agencies

| Agency/Group Relationship and Responsibility | Interrelationship |
|---|---|
| FEDERAL AGENCIES | |
| Fish and Wildlife Service (FWS) | |
| Responsible for protection of threatened and endangered plant and animal species and their habitat. Administers predator control program. | FWS issues a biological opinion on the effects of livestock grazing on endangered species involved in the action. BLM authorizes predator control on planning area allotments. The actual control work is done by the FWS under an on-going predator control program. |
| National Park Service (NPS) | |
| Administers Capitol Reef National Park and Glen Canyon National Recreation Area. | The BLM administers the livestock grazing program within National Park Service administered lands. |
| STATE AGENCIES | |
| Utah Division of Wildlife Resources | |
| Responsible for wildlife numbers. | The BLM is responsible for wildlife habitat. BLM cooperates with the Utah Division of Wildlife Resources to identify crucial ranges, current population estimates, and habitat for proposed transplant programs. |
| Utah State Historic Preservation Officer | |
| Coordinates the identification, evaluation, and protection of cultural resources within the State of Utah. | BLM requests consultation regarding Section 106 of the National Historic Preservation Act. |

# CHAPTER 2
# DESCRIPTION OF ALTERNATIVES

## INTRODUCTION

This chapter describes the alternatives to be analyzed and briefly compares the environmental consequences of each. The array of alternatives evaluates and compares different approaches to managing rangeland resources within the Henry Mountain Planning Area. The alternatives were developed from the multiple-use recommendations in Step 2 of the Management Framework Plan (MFP) and from resource specialists' recommendations in MFP Step 1. (See Figure 1-3 and Table 2-1 for evolution of the preferred alternative through the planning process.)

This chapter is divided into two sections. Section 1 describes each alternative in detail. The description includes: (1) the rationale used in development of the alternative; and (2) identification of change agents. (Change agents are those actions which can be controlled when managing rangeland resources. Examples are forage use by number and kind of animal, rangeland improvements, and livestock periods and patterns of use.) Section 2 describes administrative features common to all alternatives. Features include implementation and scheduling of rangeland monitoring programs; grazing administration practices; and standard design, construction, and operating features.

## DESCRIPTION OF ALTERNATIVES

Table 2-2 shows current and proposed big game and livestock forage use for each alternative. Summary Figure 1 and Table 2-3 compare forage use by alternative. Table 2-4 outlines rangeland improvements for Alternatives C, D, and E. No rangeland improvements were analyzed for Alternatives A and B. However, rangeland improvements could be implemented from Alternatives C, D, or E should either Alternative A or B be selected.

### Alternative A: Proposed Action: No Change—Permit Livestock/Big Game Grazing at Current Average Levels of Use

This alternative is the proposed action and is the continuation of the present management situation, including maintaining current levels and patterns of big game and livestock use. The proposed action is for analysis purposes in this EIS and is not the Bureau of Land Management's (BLM) preferred alternative.

Active livestock use would continue at the average licensed use of the past 5 years. However, if current grazing use (as of 1982) is higher or lower than the average of the past 5 years licensed use, this figure would be considered as the proposed grazing level. In addition, big game use would continue at current numbers, as determined by the Utah Division of Wildlife Resources (UDWR) and the BLM. Forage would be provided for existing numbers of wild burros. The present levels of grazing management and monitoring would continue. Rangeland improvements would be confined to maintenance of those structures, practices, and treatments already existing.

Under this alternative, proposed forage use on BLM and National Recreation Area (NRA) lands would be as follows:

| | |
|---|---|
| Livestock | 26,631 AUMs |
| Bison | 2,696 AUMs |
| Deer | 2,246 AUMs |
| Antelope | 87 AUMs |
| Bighorn Sheep | 75 AUMs |
| Burros | 100 AUMs |

See Table 2-2 for proposed forage use by allotment. The individual permittees' records from 1976-1981 were averaged to arrive at licensed use on allotments.

### Alternative B: No Action—Maintain Existing Forage Allocation

This alternative meets the National Environmental Policy Act (NEPA) requirement for analysis of the No Action Alternative. This alternative analyzes grazing at the active preference level for livestock, allowing for existing deer and bison reservations, and allowing for existing numbers of wild burros. Under this alternative, antelope and bighorn sheep would not be provided forage and would be removed. The present active preference levels of grazing management and monitoring would be maintained. Rangeland improvements would be confined to maintenance of those structures, practices, or treatments already existing.

Under this alternative, forage use on BLM and NRA lands would be as follows:

| | |
|---|---|
| Livestock | 56,285 AUMs |
| Bison | 2,400 AUMs |
| Deer | 4,800 AUMs |
| Burros | 100 AUMs |

See Table 2-2 for forage use by allotment.

TABLE 2-1

Evolution of the Preferred Alternative Through the Planning Process

| Livestock MFP Step 1 Recommendation | Recommendations That Conflict With the Livestock Recommendation | MFP Step 2 Planning Recommendation | Trade-Off |
|---|---|---|---|
| Proposed Forage Use | | | |
| Manage for optimum livestock production within existing allotments and other potential areas, using the soil-vegetation inventory as a basis and providing forage for wild burros and big game where use is compatible with livestock. | | Manage rangeland to provide the best mix of livestock and big game to maintain or increase the forage available, using the soil-vegetation inventory as a basis. | Forage would be provided to allow for the most advantageous use. |
| 1. Give livestock priority for forage use as follows: | 1. Give big game priority for forage use as follows: | 1. Optimize big game and livestock forage use as follows: | 1. Livestock would not receive priority in forage use. |
| a. Provide 100 AUMs for wild burros as required by the Wild Horse and Burro Act on Robbers Roost Allotment. | a. No conflict. | a. Provide 100 AUMs for wild burros as required by the Wild Horse and Burro Act. | a. No change. |
| b. Provide 45,177 AUMs for cattle and 12,851 AUMs for sheep within established allotments (58,028 AUMs). | b. Provide forage not required for optimum big game production for livestock (35,722 AUMs for cattle and 4,082 AUMs for sheep). Eliminate sheep use on Rockies and Trachyte Allotments (39,804 AUMs). | b. Provide 42,006 AUMs for cattle and 8,481 AUMs for sheep within established allotments and use 1,332 AUMs on Flint Trail area on an as-needed basis for cattle (50,487 AUMs). | b. Livestock use would be limited. 7,541 AUMs would be foregone. |
| c. Provide 1,500 AUMs for cattle in unallotted Dry Lakes, Flint Trail, and Little Rockies Allotments. | c. Reserve unallotted areas for big game. | c. Reserve unallotted areas for big game except as specified above on Flint Trail. | c. Use of Dry Lakes and Little Rockies unallotted areas. |
| d. Provide 980 AUMs for bighorn sheep on cattle allotments and 1,356 AUMs on unallotted areas where conflicts with domestic sheep are not expected. Eliminate bighorn sheep use on Rockies and Trachyte Allotments. | d. Provide 2,612 AUMs for bighorn sheep on allotments and 1,356 AUMs on unallotted areas. | d. Provide 2,574 AUMs for bighorn sheep on allotments and 1,356 AUMs on unallotted areas to meet long-term objectives. | d. Bighorn sheep would be allowed to graze on allotments with domestic sheep at 1,594 AUMs more than the livestock recommendation. |
| e. Provide 87 AUMs for antelope where established herds exist. | e. Provide 960 AUMs for antelope on established rangeland. | e. Provide 695 AUMs for antelope on allotments with existing herds to allow for 500 to 1,000 percent increases. | e. Antelope numbers would be more than that proposed in the livestock recommendation. |
| f. Provide 2,323 AUMs of excess forage to deer. | f. Provide optimum deer use of 5,688 AUMs on allotments and 439 AUMs on unallotted areas. | f. Provide 5,200 AUMs for deer on allotments and 441 AUMs on unallotted areas to approach prior stable numbers on all allotments where forage is sufficient and there is no conflict with other big game numbers. | f. Deer would be allowed to increase 2,877 AUMs more than the livestock recommendation. |
| | g. Provide 3,657 AUMs for bison on allotments and 111 on Ory Lakes (unallotted area) to optimize the use of available forage in bison habitat. | g. Provide 2,000 AUMs for bison on allotments and 88 AUMs (current capacity) on Ory Lakes (unallotted area) to provide for 200 mature animals and replacement needs. | g. Forage would be provided for 200 mature bison and replacements (2,088 AUMs). |
| 2. Change the period of use on Cedar Point, Crescent Creek, North Bench, Waterpocket, and Wild Horse Allotments to increase the useability of livestock forage. | 2. Maintain existing livestock periods of use which are more compatible with big game needs. | 2. Change periods of use as proposed in the livestock recommendation. | 2. None. |
| 3. Implement rangeland developments and land treatments where beneficial to livestock use, if compatible with big game. | 3. Implement rangeland developments and land treatments where beneficial to big game. | 3. Implement rangeland developments and land treatments from both recommendations at a compatible level for livestock and big game. | 3. Rangeland improvements would be compatible with big game use. |

TABLE 2-2

CURRENT LIVESTOCK/BIG GAME FORAGE USE
Alternative A: Proposed Action--No Change
Current Average Levels of Use

| | Livestock[a] | | | | Bison | | | | Mule Deer | | | Antelope | Bighorn Sheep | Burros |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLOTMENTS | Kind of Livestock | Active Preference (AUMs) | Average Licensed Use (AUMs) | Forage Available to Livestock (AUMs) | Proposed Grazing Use (AUMs) | Crucial Winter (AUMs) | Crucial Summer (AUMs) | Crucial Yearlong (AUMs) | Proposed Grazing Use (AUMs) | Crucial Winter (AUMs)[b] | Crucial Summer (AUMs)[b] | Proposed Grazing Use (AUMs) | Proposed Grazing Use (AUMs) | Proposed Grazing Use (AUMs) |
| Blue Bench | Cattle | 4,598 | 1,963 | 2,749 | 5 (8)[c] | 0 | 5 (8) | 0 | 34 | 1 | 0 | 0 | 0 | 0 |
| Bullfrog[d] | Cattle | 3,120 | 1,459 | 2,337 | 74 | 74 | 0 | 0 | 62 | 22 | 0 | 0 | 0 | 0 |
| | Sheep | 322 | 80[e] | 233 | (97) | (97) | | | | | | | | |
| Burr Point | Cattle | 2,138 | 1,337 | 2,951 | 15 | 0 | 15 | 0 | 32 | 0 | 1 | 18 | 0 | 0 |
| | Sheep | 2,279 | No Use | 914 | | | | | (35) | | (4) | | | |
| Cathedral | Cattle | 2,998 | 1,247 | 2,366 | 0 | 0 | 0 | 0 | 121 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,503 | B 1,035 | B 1,871 | | | | | | | | | | |
| | | P 495 | P 212 | P 495 | | | | | | | | | | |
| Cedar Point | Cattle | 1,892 | 819 | 1,294 | 8 (15) | 0 | 8 (15) | 0 | 55 | 33 | 0 | 19 | 0 | 0 |
| Crescent Ck. | Cattle | 332 | 335 | 181 | 65 | 0 | 65 | 0 | 81 | 0 | 75 | 0 | 0 | 0 |
| Hanksville | Cattle | 4,538 | 2,499 | 6,511 | 18 | 0 | 18 | 0 | 44 | 0 | 0 | 19 | 0 | 0 |
| | Sheep | 1,462 | No Use | 985 | | | | | | | | | | |
| Hartnet | Cattle | 2,938 | 1,724 | 2,884 | 0 | 0 | 0 | 0 | 103 | 0 | 0 | 0 | 0 | 0 |
| | | B 1,021 | B 603 | B 967 | | | | | | | | | | |
| | | P 1,917 | P 1,121 | P 1,917 | | | | | | | | | | |
| Nasty Flat | Cattle | 474 | 436 | 297 | 685 | 0 | 457 | 228 | 71 (73) | 6 (8) | 55 | 0 | 0 | 0 |
| North Bench | Cattle | 456 | 46 | 306 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| Pennell | Cattle | 2,420 | 1,391 | 2,240 | 952 | 0 | 576 | 376 | 205 | 88 | 72 | 0 | 0 | 0 |
| | Sheep | 174 | No Use | 109 | (958) | (6) | | | | | | | | |
| Robbers Roost[d] | Cattle | 5,288 | 2,808 | 6,902 | 0 | 0 | 0 | 0 | 392 | 0 | 0 | 31 | 22 | 100 |
| Rockies[d] | Cattle | 5,600 | 3,554 | 4,003 | 0 | 0 | 0 | 0 | 69 | 0 | 14 | 0 | 16 | 0 |
| | Sheep | 272 | 34[e] | 249 | | | | | (75) | | (20) | | | |
| Sandy 1 | Cattle | 1,209 | 945 | 949 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 |
| | | B 927 | B 728 | B 667 | | | | | | | | | | |
| | | P 282 | P 217 | P 282 | | | | | | | | | | |
| | Sheep | B 51 | No Use | 0 | | | | | | | | | | |
| Sandy 2 | Cattle | 2,228 | 1,509 | 715 | 122 (155) | 105 (138) | 17 | 0 | 29 | 0 | 0 | 0 | 0 | 0 |
| Sandy 3 | Cattle | 985 | 592 | 981 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| | | B 305 | B 184 | B 301 | | | | | | | | | | |
| | | P 680 | P 408 | P 680 | | | | | | | | | | |
| Sawmill Basin | Cattle | 166 | 33 | 64 | 146 | 0 | 146 | 0 | 95 | 0 | 88 | 0 | 0 | 0 |
| Sewing Machine[d] | Cattle | 1,600 | 950 | 2,681 | 0 | 0 | 0 | 0 | 167 | 0 | 0 | 0 | 21 | 0 |
| Steele Butte | Cattle | 5,034 | 2,066 | 1,888 | 202 (288) | 178 (249) | 17 | 7 (22) | 112 | 54 | 0 | 0 | 0 | 0 |
| Trachyte | Cattle | 2,110 | 1,120 | 1,109 | 20 | 0 | 20 | 0 | 59 | 27 | 15 | 0 | 16 | 0 |
| | Sheep | 743 | 84[e] | 475 | | | | | | | | | | |
| Waterpocket[d] | Cattle | 3,025 | 1,489 | 3,107 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,861 | B 1,415 | B 2,943 | | | | | | | | | | |
| | | P 164 | P 74 | P 164 | | | | | | | | | | |
| | Sheep | 322 | 108[e] | 280 | | | | | | | | | | |
| | | B 304 | B 103 | B 262 | | | | | | | | | | |
| | | P 18 | P 5 | P 18 | | | | | | | | | | |
| Wild Horse | Cattle | 1,067 | 40 | 1,491 | 0 | 0 | 0 | 0 | 128 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | Cattle | 54,216 | 28,362 | 48,006 | 2,312 (2,470) | 357 (490) | 1,344 (1,354) | 611 (626) | 1,974 (1,985) | 231 (233) | 320 (329) | 87 | 75 | 100 |
| | | B 50,678 | 26,330 | 44,468 | | | | | | | | | | |
| | | P 3,538 | 2,032 | 3,538 | | | | | | | | | | |
| | Sheep | 5,625 | 306 | 3,245 | | | | | | | | | | |
| | | B 5,607 | 301 | 3,227 | | | | | | | | | | |
| | | P 18 | 5 | 18 | | | | | | | | | | |
| Unallotted Areas | | | | | | | | | | | | | | |
| Ory Lakes | None | | | | 100 (226) | 0 | 73 | 27 (153) | 59 | 0 | 54 | 0 | 0 | 0 |
| Flint Trail[d] | None | | | | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 |
| Little Rockies[d] | None | | | | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| North Caineville Mesa | No Livestock Use | | | | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| South Caineville Mesa | No Livestock Use | | | | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | | 0 | 0 | 0 | 100 (226) | 0 | 73 | 27 (153) | 261 | 0 | 54 | 0 | 0 | 0 |
| TOTAL[f] | | 59,841 | 28,668 | 51,251 | 2,412 (2,696) | 357 (490) | 1,417 (1,427) | 638 (779) | 2,235 (2,246) | 231 (233) | 374 (383) | 87 | 75 | 100 |

[a] Active preference and average licensed use AUMs are for BLM and NRA (see footnote [c]) lands only, except for allotments containing National Park Lands. B = BLM, P = Park.

[b] Deer AUMs are comprised of crucial summer and crucial winter ranges.

[c] Numbers in ( ) are actual AUMs needed from BLM administered lands (as per UOWR and BLM agreement); however, there is not enough forage available to meet these needs.

[d] Includes both BLM and NRA lands

[e] Intermittent use.

[f] Includes 3,556 AUMs of active preference and 2,037 AUMs of average licensed use in Capitol Reef National Park.

TABLE 2-2 (continued)

Alternative B: No Action
Maintain Existing Forage Allocation

| ALLOTMENTS | Livestock[a] Kind of Livestock | Active Preference (AUMs) | Average Licensed Use (AUMs) | Bison 1974 Reservations (AUMs) | Bison Crucial Winter (AUMs) | Bison Crucial Summer (AUMs) | Bison Crucial Yearlong (AUMs) | Mule Deer 1974 Reservations (AUMs) | Mule Deer Crucial Winter (AUMs)[b] | Mule Deer Crucial Summer (AUMs)[b] | Antelope (AUMs) | Bighorn Sheep (AUMs) | Burros (AUMs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue Bench | Cattle | 4,598 | 1,963 | 16 | 0 | 16 | 0 | 76 | 4 | 0 | 0 | 0 | 0 |
| Bullfrog[c] | Cattle | 3,120 | 1,459 | 36 | 36 | 0 | 0 | 97 | 37 | 0 | 0 | 0 | 0 |
| | Sheep | 322 | 80[d] | | | | | | | | | | |
| Burr Point | Cattle | 2,138 | 1,337 | 13 | 0 | 13 | 0 | 65 | 0 | 9 | 0 | 0 | 0 |
| | Sheep | 2,279 | No Use | | | | | | | | | | |
| Cathedral | Cattle | 2,998 | 1,247 | 0 | 0 | 0 | 0 | 274 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,503[b] | B 1,035 | | | | | | | | | | |
| | | P 495[b] | P 212 | | | | | | | | | | |
| Cedar Point | Cattle | 1,892 | 819 | 10 | 0 | 10 | 0 | 119 | 59 | 0 | 0 | 0 | 0 |
| Crescent Creek | Cattle | 332 | 335 | 55 | 0 | 55 | 0 | 185 | 0 | 214 | 0 | 0 | 0 |
| Hanksville | Cattle | 4,538 | 2,499 | 16 | 0 | 16 | 0 | 76 | 0 | 0 | 0 | 0 | 0 |
| | Sheep | 1,462 | No Use | | | | | | | | | | |
| Hartnet | Cattle | 2,938 | 1,724 | 0 | 0 | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 0 |
| | | B 1,021 | B 603 | | | | | | | | | | |
| | | P 1,917 | P 1,121 | | | | | | | | | | |
| Nasty Flat | Cattle | 474 | 436 | 612 | 0 | 404 | 208 | 176 | 18 | 214 | 0 | 0 | 0 |
| North Bench | Cattle | 456 | 46 | 0 | 0 | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 0 |
| Pennell | Cattle | 2,420 | 1,391 | 926 | 10 | 569 | 347 | 468 | 186 | 198 | 0 | 0 | 0 |
| | Sheep | 174 | No Use | | | | | | | | | | |
| Robbers Roost[c] | Cattle | 5,288 | 2,808 | 0 | 0 | 0 | 0 | 808 | 0 | 0 | 0 | 0 | 100 |
| Rockies[c] | Cattle | 5,600 | 3,554 | 0 | 0 | 0 | 0 | 163 | 0 | 46 | 0 | 0 | 0 |
| | Sheep | 272 | 34[d] | | | | | | | | | | |
| Sandy 1 | Cattle | 1,209 | 945 | 0 | 0 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 |
| | | B 927 | B 728 | | | | | | | | | | |
| | | P 282 | P 217 | | | | | | | | | | |
| | Sheep | B 51 | No Use | | | | | | | | | | |
| Sandy 2 | Cattle | B 2,228 | 1,509 | 130 | 120 | 10 | 0 | 67 | 0 | 0 | 0 | 0 | 0 |
| Sandy 3 | Cattle | 985 | 592 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 |
| | | B 305 | B 184 | | | | | | | | | | |
| | | P 680 | P 408 | | | | | | | | | | |
| Sawmill Basin | Cattle | 166 | 33 | 131 | 0 | 131 | 0 | 217 | 0 | 216 | 0 | 0 | 0 |
| Sewing Machine[c] | Cattle | 1,600 | 950 | 0 | 0 | 0 | 0 | 379 | 0 | 0 | 0 | 0 | 0 |
| Steele Butte | Cattle | 5,034 | 2,066 | 254 | 220 | 15 | 19 | 256 | 125 | 0 | 0 | 0 | 0 |
| Trachyte | Cattle | 2,110 | 1,120 | 11 | 0 | 11 | 0 | 163 | 67 | 57 | 0 | 0 | 0 |
| | Sheep | 743 | 84[d] | | | | | | | | | | |
| Waterpocket[c] | Cattle | 3,025 | 1,489 | 0 | 0 | 0 | 0 | 72 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,861 | B 1,415 | | | | | | | | | | |
| | | P 164 | P 74 | | | | | | | | | | |
| | Sheep | 322 | 108[d] | | | | | | | | | | |
| | | B 304 | B 103 | | | | | | | | | | |
| | | P 18 | P 5 | | | | | | | | | | |
| Wild Horse | Cattle | 1,067 | 40 | 0 | 0 | 0 | 0 | 292 | 0 | 0 | 0 | 0 | 0 |
| Subtotal[e] | | 59,841 | 28,668 | 2,210 | 386 | 1,250 | 574 | 4,226 | 496 | 954 | 0 | 0 | 100 |
| Unallotted Areas | | | | | | | | | | | | | |
| Ory Lakes | None | | | 190 | 0 | 65 | 125 | 113 | 0 | 130 | 0 | 0 | 0 |
| Flint Trail[c] | None | | | 0 | 0 | 0 | 0 | 377 | 0 | 0 | 0 | 0 | 0 |
| Little Rockies[c] | None | | | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 |
| North Caineville Mesa | No Livestock Use | | | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 |
| South Caineville Mesa | No Livestock Use[f] | | | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 |
| Subtotal[e] | | 0 | 0 | 190 | 0 | 65 | 125 | 574 | 0 | 130 | 0 | 0 | 0 |
| TOTAL[e] | | 59,841 | 28,668 | 2,400 | 386 | 1,315 | 699 | 4,800 | 496 | 1,084 | 0 | 0 | 100 |

[a]Active preference and average licensed use AUMs are all for BLM lands except for allotments containing both BLM and National Park lands: B = BLM, P = Park.

[b]Deer AUMs are part of the 1974 mule deer reservations.

[c]Includes both BLM and NRA lands.

[d]Intermittent use.

[e]Includes 3,556 AUMs active preference and 2,037 average licensed use in Capitol Reef National Park.

[f]Part of Blue Bench Allotment not grazed.

TABLE 2-2 (continued)

Alternative C: Manage For Optimum Big Game Production

| ALLOTMENTS | Livestock: Kind of Livestock | Livestock: Alternative Grazing Use (AUMs) | Livestock: Period of Use: Current | Livestock: Period of Use: Proposed | Bison: Alternative Grazing Use (AUMs) | Bison: Crucial Winter (AUMs) | Bison: Crucial Summer (AUMs) | Bison: Crucial Yearlong (AUMs) | Mule Deer: Alternative Grazing Use (AUMs) | Mule Deer: Crucial winter (AUMs)[a] | Mule Deer: Crucial Summer (AUMs)[a] | Antelope: Alternative Grazing Use (AUMs) | Bighorn Sheep: Alternative Grazing Use (AUMs) | Burros: Alternative Grazing Use (AUMs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue Bench | Cattle | 2,737 | 9/1-5/31 | No change. | 5 (14)[b] | 0 | 5 (14) | 0 | 179 | 5 | 0 | 0 | 0 | 0 |
| Bullfrog[c] | Cattle | 2,123 | 10/1-5/31 | No change | 74 | 74 | 0 | 0 | 375 | 143 | 0 | 0 | 0 | 0 |
| | Sheep | 1,229 | 10/1-5/31 | No change | (85) | (85) | | | | | | | | |
| Burr Point | Cattle | 1,725 | 9/1-5/31 | No change | 28 | 0 | 28 | 0 | 179 | 0 | 0 | 277 | 0 | 0 |
| | Sheep | 488 | 10/1-5/5 | No change | | | | | (204) | | (25) | | | |
| Cathedral[d] | Cattle | 2,366 | 10/1-5/31 | No change | 0 | 0 | 0 | 0 | 222 | 0 | 0 | 0 | 0 | 0 |
| | B | 1,871 | | | | | | | | | | | | |
| | P | 495 | | | | | | | | | | | | |
| Cedar Point | Cattle | 1,029 | 9/1-5/31 | No change | 5 (27) | 0 | 5 (27) | 0 | 180 (331) | 54 (205) | 0 | 180 | 0 | 0 |
| Crescent Ck. | No livestock grazing | | | (None) | 159 | 0 | 159 | 0 | 288 (478) | 0 | 253 (443) | 0 | 0 | 0 |
| Hanksville | Cattle | 4,538 | 9/1-5/31 | No change | 35 | 0 | 35 | 0 | 240 | 0 | 0 | 129 | 0 | 0 |
| | Sheep | 1,462 | 10/1-5/31 | No change | | | | | | | | | | |
| Hartnet[d] | Cattle | 2,884 | 11/1-6/15 | No change | 0 | 0 | 0 | 0 | 128 | 0 | 0 | 0 | 0 | 0 |
| | B | 967 | | | | | | | | | | | | |
| | P | 1,917 | | | | | | | | | | | | |
| Nasty Flat | No livestock grazing | | | (None) | 870 (1,455) | 0 | 652 (977) | 218 (478) | 248 (530) | 6 (50) | 165 (403) | 0 | 0 | 0 |
| North Bench | Cattle | 306 | 9/1-3/31 | No change | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 0 |
| Pennell | No livestock grazing | | | (None) | 1,971 (1,995) | 0 (24) | 1,194 | 777 | 1,050 (1,300) | 303 (553) | 458 | 0 | 0 | 0 |
| Robbers Roost[c] | Cattle | 6,439 | 3/1-2/28 | No change | 0 | 0 | 0 | 0 | 392 | 0 | 0 | 374 | 819 | 100 |
| Rockies[c] | Cattle | 2,858 | 10/1-5/31 | No change | 0 | 0 | 0 | 0 | 392 | 0 | 6 | 0 | 832 | 0 |
| | Sheep | 0[e] | | (None) | | | | | (439) | | (53) | | | |
| Sandy 1[d] | Cattle | 938 | 10/1-4/15 | No change | 0 | 0 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 |
| | B | 656 | | | | | | | | | | | | |
| | P | 282 | | | | | | | | | | | | |
| | Sheep | 210[f] | 10/1-4/15 | No change[f] | | | | | | | | | | |
| Sandy 2 | Cattle | 701 | 10/16-4/15 | No change | 138 (309) | 105 (276) | 33 | 0 | 62 | 0 | 0 | 0 | 0 | 0 |
| Sandy 3[d] | Cattle | 981 | 10/16-4/15 | No change | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 |
| | B | 301 | | | | | | | | | | | | |
| | P | 680 | | | | | | | | | | | | |
| Sawmill Basin | No livetock grazing | | | (None) | 133 (309) | 0 | 133 (309) | 0 | 256 (586) | 0 | 212 (542) | 0 | 0 | 0 |
| Sewing Machine[c] | Cattle | 2,646 | 11/1-4/15 | No change | 0 | 0 | 0 | 0 | 167 | 0 | 0 | 0 | 897 | 0 |
| Steele Butte | Cattle | 1,862[g] | 10/16-5/31 | No change | 219 (590) | 178 (512) | 34 | 7 (44) | 488 (709) | 189 (410) | 0 | 0 | 0 | 0 |
| Trachyte | Cattle | 978 | 9/1-5/31 | No change | 20 | 0 | 20 | 0 | 343 | 165 | 28 (96) | 0 | 64 | 0 |
| | Sheep | 0[e] | | (None) | | | | | | | | | | |
| Waterpocket[c,d] | Cattle | 3,082 | 10/1-5/31 | No change | 0 | 0 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 |
| | B | 2,918 | | | | | | | | | | | | |
| | P | 164 | | | | | | | | | | | | |
| | Sheep | 711 | 10/1-5/31 | No change | | | | | | | | | | |
| | B | 693 | | | | | | | | | | | | |
| | P | 18 | | | | | | | | | | | | |
| Wild Horse | Cattle | 1,067 | 12/1-6/30 | No change | 0 | 0 | 0 | 0 | 128 | 0 | 0 | 0 | 0 | 0 |
| Subtotal[h] | Cattle | B 35,722 | | | 3,657 | 357 | 2,298 | 1,002 | 5,688 | 865 | 1,122 | 960 | 2,612 | 100 |
| | | P 3,538 | | | | | | | | | | | | |
| | Sheep | B 4,082 | | | (5,026) | (897) | (2,830) | (1,299) | (7,184) | (1,531) | (2,020) | | | |
| | | P 18 | | | | | | | | | | | | |
| Unallotted Areas | | | | | | | | | | | | | | |
| Ory Lakes | No livestock grazing | | | | 111 (432) | 0 | 100 (132) | 11 (300) | 141 (337) | 0 0 | 123 (319) | 0 | 0 | 0 |
| Flint Trail[c] | No livestock grazing | | | | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 808 | 0 |
| Little Rockies[c] | No livestock grazing | | | | 0 | 0 | 0 | 0 | 112 | 0 | 0 | 0 | 548 | 0 |
| North Caineville Mesa | No Livestock grazing (except for research) | | | | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| South Caineville Mesa | No Livestock grazing (except for research) | | | | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | | | | | 111 (432) | 0 | 100 (132) | 11 (300) | 439 (635) | 0 | 123 (319) | 0 | 1,356 | 0 |
| TOTAL | | 43,360 | | | 3,768 (5,458) | 357 (897) | 2,398 (2,962) | 1,013 (1,599) | 6,127 (7,819) | 865 (1,531) | 1,245 (2,339) | 960 | 3,968 | 100 |

[a] Total deer AUMs are comprised of crucial summer and crucial winter ranges only.

[b] Numbers in ( ) are actual AUMs needed from BLM-administered lands to meet UOWR's long-range goals; however, forage is not available to meet these needs.

[c] Includes both BLM and NRA lands.

[d] These allotments have both BLM and National Park Lands. B = BLM AUMs, P = National Park AUMs.

[e] Oomestic and bighorn sheep compatibility conflicts on these allotments.

[f] No livestock grazing proposed on Swapp Mesa.

[g] No livestock grazing proposed on Cave Flat.

[h] BLM and NRA lands only, does not include National Park.

TABLE 2-2 (continued)

Alternative 0: Manage for Optimum Livestock Production

| ALLOTMENTS | Livestock: Kind of Livestock | Livestock: Alternative Grazing Use (AUMs) | Livestock: Period of Use: Current | Livestock: Period of Use: Proposed | Bison: Alternative Grazing Use (AUMs) | Mule Deer: Alternative Grazing Use (AUMs) | Mule Deer: Crucial Winter (AUMs)[a] | Mule Deer: Crucial Summer (AUMs)[a] | Antelope: Alternative Grazing Use (AUMs) | Bighorn Sheep: Alternative Grazing Use (AUMs) | Burros: Alternative Grazing Use (AUMs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue Bench | Cattle | 2,756 | 9/1-5/31 | No change | 0 | 34 | 1 | 0 | 0 | 0 | 0 |
| Bullfrog[b] | Cattle | 2,192 | 10/1-5/31 | No change | 0 | 62 | 22 | 0 | 0 | 0 | 0 |
| | Sheep | 1,302 | 10/1-5/31 | No change | | | | | | | |
| Burr Point | Cattle | 2,957 | 9/1-5/31 | No change | 0 | 29 | 0 | 1 | 18 | 0 | 0 |
| | Sheep | 919 | 10/-5/5 | No change | | (35) | | (4) | | | |
| Cathedral[c] | Cattle | 2,366 | 10/1-5/31 | No change | 0 | 121 | 0 | 0 | 0 | 0 | 0 |
| | | B 1,871 | | | | | | | | | |
| | | P 495 | | | | | | | | | |
| Cedar Point | Cattle | 1,334 | 9/1-5/31 | 9/1-4/30 | 0 | 55 | 33 | 0 | 19 | 0 | 0 |
| Crescent Creek | Cattle | 205 | 6/1-9/15 | 5/1-9/15 | 0 | 81 | 0 | 75 | 0 | 0 | 0 |
| Hanksville | Cattle | 6,348 | 9/1-5/31 | No change | 0 | 44 | 0 | 0 | 19 | 0 | 0 |
| | Sheep | 4,331 | 10/1-5/5 | No change | | | | | | | |
| Hartnet[c] | Cattle | 2,884 | 11/1-6/15 | No change | 0 | 103 | 0 | 0 | 0 | 0 | 0 |
| | | B 967 | | | | | | | | | |
| | | P 1,917 | | | | | | | | | |
| Nasty Flat | Cattle | 958 | 6/1-9/30 | No change | 0 | 71 | 6 | 55 | 0 | 0 | 0 |
| | | | | | | (73) | (8) | | | | |
| North Bench | Cattle | 306 | 9/1-3/31 | 9/1-6/30 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| Pennell | Cattle | 2,471 | 6/1-10/31 | No change | 0 | 204 | 88 | 72 | 0 | 0 | 0 |
| | Sheep | 1,228 | 6/1-10/31 | No change | | | | | | | |
| Robbers Roost[b] | Cattle | 6,902 | 3/1-2/28 | No change | 0 | 392 | 0 | 0 | 31 | 22[d] | 100 |
| Rockies[b] | Cattle | 3,725 | 10/1-5/31 | No change | 0 | 69 | 0 | 6 | 0 | 16[d] | 0 |
| | Sheep | 2,655 | 10/1-5/31 | No change | | (75) | | (8) | | | |
| Sandy 1[c] | Cattle | 938 | 10/1-4/15 | No change | 0 | 33 | 0 | 0 | 0 | 0 | 0 |
| | | B 656 | | | | | | | | | |
| | | P 282 | | | | | | | | | |
| | Sheep | 210 | 10/1-4/15 | No change | | | | | | | |
| Sandy 2 | Cattle | 885 | 10/16-4/15 | No change | 0 | 29 | 0 | 0 | 0 | 0 | 0 |
| Sandy 3[c] | Cattle | 981 | 10/16-4/15 | No change | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| | | B 301 | | | | | | | | | |
| | | P 680 | | | | | | | | | |
| Sawmill Basin[b] | Cattle | 153 | 7/16-8/31 | No change | 0 | 95 | 0 | 88 | 0 | 0[d] | 0 |
| Sewing Machine[b] | Cattle | 2,681 | 11/1-4/15 | No change | 0 | 167 | 0 | 0 | 0 | 925[d] | 0 |
| Steele Butte | Cattle | 2,022 | 10/16-5/31 | No change | 0 | 110 | 54 | 0 | 0 | 0[d] | 0 |
| Trachyte | Cattle | 1,066 | 9/1-5/31 | No change | 0 | 59 | 27 | 15 | 0 | 17[d] | 0 |
| | Sheep | 1,453 | 10/1-5/5 | No change | | | | | | | |
| Waterpocket[b,c] | Cattle | 3,090 | 10/1-5/31 | 10/1-4/15 | 0 | 31 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,926 | | | | | | | | | |
| | | P 164 | | | | | | | | | |
| | Sheep | 771 | 10/1-5/31 | 10/1-4/15 | | | | | | | |
| | | B 753 | | | | | | | | | |
| | | P 18 | | | | | | | | | |
| Wild Horse | Cattle | 1,495 | 12/1-6/30 | 9/1-6/30 | 0 | 128 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | | B 45,177 C | | | 0 | 1,968 | 231 | 312 | 87 | 980 | 100 |
| | | P 3,538 C | | | | (1,982) | (233) | (317) | | | |
| | | B 12,851 S | | | | | | | | | |
| | | P 18 S | | | | | | | | | |
| Unallotted Areas | | | | | | | | | | | |
| Dry Lakes | Cattle | 83 | None | 7/15-8/30 | 0 | 57 | 0 | 54 | 0 | 0 | 0 |
| Flint Trail[b] | Cattle | 1,332 | None | 10/1-4/15 | 0 | 166 | 0 | 0 | 0 | 808 | 0 |
| Little Rockies[b] | Cattle | 85 | None | 9/15-3/30 | 0 | 112 | 0 | 0 | 0 | 548 | 0 |
| North Caineville Mesa | No Livestock grazing | | None | None | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| South Caineville Mesa | No Livestock grazing | | None | None | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | | 1,500 | | | 0 | 355 | 0 | 54 | 0 | 1,356 | 0 |
| TOTAL | | B 46,677 C | | | 0 | 2,323 | 231 | 366 | 87 | 2,336 | 100 |
| | | P 3,538 C | | | | (2,337) | (233) | (371) | | | |
| | | B 12,841 S | | | | | | | | | |
| | | P 18 S | | | | | | | | | |
| | | 63,084[e] | | | | | | | | | |

[a] Total deer AUMs are comprised of crucial summer and crucial winter ranges only.

[b] Includes both BLM and NRA lands.

[c] These allotments have both BLM and National Park Lands. B = BLM AUMs and P = National Park AUMs.

[d] Domestic and bighorn sheep compatibility conflict in these allotments.

[e] BLM and National Park total AUMs.

TABLE 2-2 (continued)

Alternative E: Preferred Alternative--MFP Step 2 Planning Recommendation

| | Livestock[a] | | | | | Bison | | | | | | Mule Deer | | | | | Antelope | | | Bighorn Sheep | | | Burros | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLOTMENTS | Kind of Livestock | Active Preference (AUMs) | Average License Use (AUMs) | Alternative Grazing Use (AUMs) | Period of Use Current | Period of Use Proposed | Long Term Objective (AUMs) | Current Grazing Use (AUMs) | Alternative Grazing Use (AUMs) | Crucial Winter (AUMs) | Crucial Summer (AUMs) | Crucial Yearlong (AUMs) | Prior Stable (AUMs) | Current Grazing Use (AUMs) | Alternative Grazing Use (AUMs) | Crucial Winter[b] (AUMs) | Crucial Summer[b] (AUMs) | Long Term Objective (AUMs) | Current Grazing Use (AUMs) | Alternative Grazing Use (AUMs) | Long Term Objective (AUMs) | Current Grazing Use (AUMs) | Alternative Grazing Use (AUMs) | Current Grazing Use (AUMs) | Alternative Grazing Use (AUMs) |
| Blue Bench | Cattle | 4,598 | 1,963 | 2,753 | 9/1-5/31 | No change | 5 (14)[c] | 5 (8) | 4 (8) | 0 | 4 (8) | 0 | 179 | 34 | 179 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bullfrog[d] | Cattle | 3,120 | 1,459[f] | 2,356[e] | 10/1-5/31 | No change | 74 (85) | 74 (97) | 45 | 45 | 0 | 0 | 375 | 62 | 375 | 143 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sheep | 322 | 80 | 679 | 10/1-5/31 | No change | | | | | | | | | | | | | | | | | | | |
| Burr Point | Cattle | 2,138 | 1,337 | 1,091[g] | 9/1-5/31 | No change | 28 | 15 | 15 | 0 | 15 | 0 | 179 (204) | 32 (35) | 175 (178) | 0 | 1 (4) | 277 | 18 | 18 | 0 | 0 | 0 | 0 | 0 |
| | Sheep | 2,279 | No Use | 1,174[g] | 10/1-5/5 | No change | | | | | | | | | | | | | | | | | | | |
| Cathedral | Cattle | 2,998 | 1,247 | 2,366 | 10/1-5/31 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 222 | 121 | 222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,503 | B 1,035 | B 1,871 | | | | | | | | | | | | | | | | | | | | | |
| | | P 495 | P 212 | P 495 | | | | | | | | | | | | | | | | | | | | | |
| Cedar Point | Cattle | 1,892 | 819 | 1,273 | 9/1-5/31 | 9/1-4/30 | 5 (27) | 8 (15) | 6 (9) | 0 | 6 (9) | 0 | 180 (331) | 55 | 161 | 34 | 0 | 174 | 19 | 174 | 0 | 0 | 0 | 0 | 0 |
| Crescent Creek | Cattle | 332 | 335 | 187 | 6/1-9/15 | 5/1-9/15 | 159 | 65 | 55 | 0 | 55 | 0 | 288 (478) | 81 | 282 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hanksville | Cattle | 4,538 | 2,499 | 6,159[h] | 9/1-5/31 | No change | 35 | 18 | 18 | 0 | 18 | 0 | 240 | 44 | 240 | 0 | 0 | 129 | 19 | 129 | 0 | 0 | 0 | 0 | 0 |
| | Sheep | 1,462 | No Use | 4,056 | 10/1-5/31 | No change | | | | | | | | | | | | | | | | | | | |
| Hartnet | Cattle | 2,938 | 1,724 | 2,884 | 11/1-5/31 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 103 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | B 1,021 | B 603 | B 967 | | | | | | | | | | | | | | | | | | | | | |
| | | P 1,917 | P 1,121 | P 1,917 | | | | | | | | | | | | | | | | | | | | | |
| Nasty Flat | Cattle | 474 | 436 | 399 | 6/1-9/30 | No change | 870 (1,455) | 685 | 576 | 0 | 348 | 228 | 248 (530) | 71 (73) | 210 (213) | 5 (8) | 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Bench | Cattle | 456 | 46 | 306 | 9/1-11/30 | 9/1-6/30 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 39 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennell | Cattle | 2,420 | 1,391 | 2,330[e] | 6/1-10/31 | No change | 1,971 (1,995) | 952 (958) | 829 (835) | 0 (6) | 456 | 373 | 1,050 1,300) | 205 | 824 | 167 | 363 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sheep | 174 | No Use | 231 | 6/1-10/31 | No change | | | | | | | | | | | | | | | | | | | |
| Robbers Roost[d] | Cattle | 5,288 | 2,808 | 6,439[h] | 3/1-2/28 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 392 | 392 | 392 | 0 | 0 | 374 | 31 | 374 | 819 | 22 | 819 | 100 | 100 |
| Rockies[d] | Cattle | 5,600 | 3,554[f] | 3,988[e] | 10/1-5/31 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 392 | 69 | 289 | 0 | 5 | 0 | 0 | 0 | 832 | 16 | 794 | 0 | 0 |
| | Sheep | 272 | 34 | 875 | 10/1-5/31 | No change | | | | | | | 439) | (75) | (292) | | (8) | | | | | | | | |
| Sandy 1 | Cattle | 1,209 | 945 | 938 | 10/1-4/15 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 33 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | B 927 | B 728 | B 656[e] | | | | | | | | | | | | | | | | | | | | | |
| | | P 282 | P 217 | P 282 | | | | | | | | | | | | | | | | | | | | | |
| | Sheep | B 51 | No Use | 210 | 10/16-4/15 | No change | | | | | | | | | | | | | | | | | | | |
| Sandy 2 | Cattle | 2,228 | 1,509 | 707 | 10/16-4/15 | No change | 138 (309) | 122 (155) | 122 (155) | 105 (138) | 17 | 0 | 62 | 29 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sandy 3 | Cattle | 985 | 592 | 981 | 10/16-4/15 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 12 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | B 305 | B 184 | B 301 | | | | | | | | | | | | | | | | | | | | | |
| | | P 680 | P 408 | P 680 | | | | | | | | | | | | | | | | | | | | | |
| Sawmill Basin | Cattle | 166 | 33 | 96 | 7/16-8/31 | No change | 133 (309) | 146 | 114 | 0 | 114 | 0 | 256 (586) | 95 | 181 | 0 | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sewing Machine[d] | Cattle | 1,600 | 950 | 2,646 | 11/1-4/15 | No change | 0 | 0 | 0 | 0 | 0 | 0 | 167 | 167 | 167 | 0 | 0 | 0 | 0 | 0 | 897 | 21 | 897 | 0 | 0 |
| Steele Butte | Cattle | 5,034 | 2,066 | 1,874 | 10/16-5/31 | No change | 219 (590) | 202 (287) | 202 (296) | 178 (257) | 17 | 7 (22) | 488 (709) | 112 | 488 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trachyte | Cattle | 2,110 | 1,120[f] | 1,164[e] | 9/1-5/31 | No change | 20 | 20 | 14 | 0 | 14 | 0 | 343 | 59 | 327 | 148 | 25 | 0 | 0 | 0 | 64 | 16 | 64 | 0 | 0 |
| | Sheep | 743 | 84[f] | 800[e] | 10/1-5/5 | No change | | | | | | | | | | | | | | | | | | | |
| Waterpocket[d] | Cattle | 3,025 | 1,489 | 3,116 | 10/1-5/31 | 10/1-4/15 | 0 | 0 | 0 | 0 | 0 | 0 | 206 | 31 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | B 2,861 | B 1,415 | B 2,952[e] | | | | | | | | | | | | | | | | | | | | | |
| | | P 164 | P 74[f] | P 164 | | | | | | | | | | | | | | | | | | | | | |
| | Sheep | 322 | 108[f] | 474 | 10/1-5/31 | 10/1-4/15 | | | | | | | | | | | | | | | | | | | |
| | | B 304 | B 103 | B 456 | | | | | | | | | | | | | | | | | | | | | |
| | | P 18 | P 5 | P 18 | | | | | | | | | | | | | | | | | | | | | |
| Wild Horse | Cattle | 1,067 | 40 | 1,491 | 12/1-6/30 | 9/1-6/30 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 128 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal[i] | | 59,841 | 28,668 | B 42,006(C)<br>P 3,538(C)<br>B 8,481(S)<br>P 18(S) | | | 3,657 (5,026) | 2,312 (2,469) | 2,000 (2,140) | 328 (446) | 1,064 (1,071) | 608 (623) | 5,688 (7,184) | 1,974 (1,985) | 5,200 (5,209) | 690 (693) | 910 (916) | 954 | 87 | 695 | 2,612 | 75 | 2,574 | 100 | 100 |
| Unallotted Areas | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dry Lakes | None | 0 | 0 | No livestock grazing | | | 111 (432) | 100 (226) | 88 (190) | 0 | 52 | 36 (138) | 141 (337) | 59 | 143 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flint Trail[d] | Cattle | 0 | 0 | j | | | 0 | 0 | 0 | 0 | 0 | 0 | 166 | 166 | 166 | 0 | 0 | 0 | 0 | 0 | 808 | 0 | 808 | 0 | 0 |
| Little Rockies[d] | None | 0 | 0 | No livestock grazing | | | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 16 | 112 | 0 | 0 | 0 | 0 | 0 | 548 | 0 | 548 | 0 | 0 |
| North Caineville Mesa | None | 0 | No use | No livestock grazing | | | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Caineville Mesa | None | 0 | No use | No livestock grazing | | | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | | 0 | 0 | 0 | | | 111 (432) | 100 (226) | 88 (190) | 0 | 52 | 36 (138) | 439 (635) | 261 | 441 | 0 | 125 | 0 | 0 | 0 | 1,356 | 0 | 1,356 | 0 | 0 |
| TOTAL[i] | | 59,841 | 28,668 | 54,043 | | | 3,768 (5,458) | 2,412 (2,695) | 2,088 (2,330) | 328 (446) | 1,116 (1,123) | 644 (761) | 6,127 (7,819) | 2,235 (2,246) | 5,641 (5,650) | 690 (693) | 1,035 (1,041) | 954 | 87 | 695 | 3,968 | 75 | 3,930 | 100 | 100 |

[a] AUM active preference, average licensed use, and proposed grazing use are for BLM-administered lands (including NRA lands; see note b) only except on those allotments containing both BLM and National Park lands: B = BLM, P = Park.

[b] Total deer AUMs are comprised of crucial summer and crucial winter ranges only.

[c] Numbers in ( ) are actual AUMs needed from BLM-administered lands (as per BLM/UOWR distribution agreement); however, forage is not available to meet these needs.

[d] Includes both BLM and NRA lands.

[e] Forage may be non-competitive between cattle and sheep on some allotments where the stocking rate is relatively low for one kind of animal. No advantage can be shown for making proportionate changes in stocking since the removal of 1 AUM of sheep use does not make available equivalent increases in cattle forage, as shown below.

| | Active Preference | | Alternative Grazing Use A | | Alternative Grazing Use B | |
|---|---|---|---|---|---|---|
| Bullfrog | AUMs | Percent | AUMs | Percent | AUMs | Percent |
| Cattle | 3,120 | 90.6 | 2,356 | 78 | 2,356 | 90.6 |
| Sheep | 322 | 9.4 | 679 | 22 | 243 | 9.4 |
| Total | 3,442 | 100.0 | 3,035 | 100 | 2,599 | 100.0 |

Non-competitive forage 679-243 = 436 AUMs (sheep).
Other allotments in this category include Rockies, Pennell, Waterpocket, Sandy 1, and Trachyte.

[f] Intermittent use.

[g] The proposed change from active preference is based on BLM regulations requiring that changes in active preference among permittees be equitable. The equitable division of the range use may not, however, result in the most efficient use of forage. Several combinations of use with cattle and sheep are possible and subject to negotiation among permittees, which could result in more desirable combination for forage use. For example, a more efficient combination for Burr Point is cattle 2,143 AUMs and sheep 620 AUMs.

[h] Allotments such as Hanksville and Robbers Roost show grazing capacity potentials in excess of active preference. There are several combinations for stocking with cattle and sheep that could make efficient use of the forage. This is contingent on the development of these allotments for grazing use including a wider distribution of reliable water sources and other means of controlling and distributing livestock grazing.

[i] Includes 3,556 AUMs active preference and 2,037 AUMs average licensed use in Capitol Reef National Park.

[j] Although Flint Trail Allotment has no grazing scheduled, it could be used on a temporary, as-needed basis for livestock grazing while other allotments were being rehabilitated or in an emergency situation.

TABLE 2-3

Comparison of Forage Use by Alternative[a]

| Allotments | Alternative A | | Alternative B | | Alternative C | | Alternative D | | Alternative E | | Classification Categories[j] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Livestock | Big Game | Livestock | Big Game | Livestock | Big Game | Livestock | Big Game | Livestock | Big Game | |
| Blue Bench | 1,963 | 42 | 4,598 | 92 | 2,737 | 184 | 2,756 | 34 | 2,753 | 183 | I |
| Bullfrog | 1,539 | 159 | 3,442 | 133 | 3,352 | 449 | 3,494 | 62 | 3,035 | 420 | M |
| Burr Point | 1,337 | 68 | 4,417 | 78 | 2,213 | 484 | 3,876 | 47 | 2,265 | 208 | M |
| Cathedral | 1,035[b] | 121 | 2,503[b] | 274 | 1,871[c] | 222 | 1,871[c] | 121 | 1,871[c] | 222 | C |
| Cedar Point | 819 | 89 | 1,892 | 129 | 1,029 | 365 | 1,334 | 74 | 1,273 | 341 | I |
| Crescent Creek | 335 | 146 | 332 | 240 | 0 | 447 | 205 | 81 | 187 | 337 | I |
| Hanksville | 2,499 | 81 | 6,000 | 92 | 6,000 | 404 | 10,679 | 63 | 10,215 | 387 | M |
| Hartnet | 603[d] | 103 | 1,021[d] | 90 | 967[c] | 128 | 967[c] | 103 | 967[c] | 128 | C |
| Nasty Flat | 436 | 758 | 474 | 788 | 0 | 1,118 | 958 | 71 | 399 | 786 | I |
| North Bench | 46 | 39 | 456 | 90 | 306 | 52 | 306 | 39 | 306 | 51 | M |
| Pennell | 1,391 | 1,163 | 2,594 | 1,394 | 0 | 3,021 | 3,699 | 204 | 2,561 | 1,653 | I |
| Robbers Roost | 2,808 | 545 | 5,288 | 908 | 6,439 | 1,685 | 6,902 | 545 | 6,439 | 1,685 | M |
| Rockies | 3,588 | 91 | 5,872 | 163 | 2,858 | 1,224 | 6,380 | 85 | 4,863 | 1,093 | I |
| Sandy 1 | 728[e] | 33 | 978[e] | 65 | 866[c] | 92 | 866[c] | 33 | 866[c] | 92 | I |
| Sandy 2 | 1,509 | 184 | 2,228 | 197 | 701 | 200 | 885 | 29 | 707 | 184 | I |
| Sandy 3 | 184[f] | 12 | 305[f] | 28 | 301 | 21 | 301[c] | 12 | 301[c] | 21 | C |
| Sawmill Basin | 33 | 241 | 166 | 348 | 0 | 389 | 153 | 95 | 96 | 295 | I |
| Sewing Machine | 950 | 188 | 1,600 | 379 | 2,646[c] | 1,064 | 2,681 | 1,092 | 2,646 | 1,064 | M |
| Steele Butte | 2,066 | 400 | 5,034 | 510 | 1,862 | 707 | 2,022 | 110 | 1,874 | 690 | I |
| Trachyte | 1,204 | 95 | 2,853 | 174 | 978 | 427 | 2,519 | 76 | 1,964 | 405 | I |
| Waterpocket | 1,518[g] | 31 | 3,165[g] | 72 | 3,611[c] | 206 | 3,679[c] | 31 | 3,408[c] | 206 | C |
| Wild Horse | 40 | 128 | 1,067 | 292 | 1,067 | 128 | 1,495 | 128 | 1,491 | 128 | M |
| Subtotal | 26,631 | 4,717 | 56,285 | 6,536 | 39,804 | 13,017 | 58,028 | 3,135 | 50,487 | 10,569 | |
| Unallotted Areas | | | | | | | | | | | |
| Ory Lakes | 0 | 285 | 0 | 303 | 0 | 252 | 83 | 57 | 0 | 231 | M |
| Flint Trail | 0 | 166 | 0 | 377 | 0 | 974 | 1,332 | 974 | 0 | 974 | M |
| Little Rockies | 0 | 16 | 0 | 37 | 0 | 660 | 85 | 660 | 0 | 660 | M |
| North Caineville Mesa | 0 | 8 | 0 | 19 | 0 | 8 | 0 | 8 | 0 | 8 | M |
| South Caineville Mesa | 0 | 12 | 0 | 28 | 0 | 12 | 0 | 12 | 0 | 12 | M |
| Subtotal | 0 | 487 | 0 | 764 | 0 | 1,906 | 1,500 | 1,711 | 0 | 1,885 | |
| GRAND TOTAL[h] | 26,631 | 5,204 | 56,285 | 7,300[i] | 39,804 | 14,923 | 59,528 | 4,846 | 50,487 | 12,454 | |

[a] Includes only BLM-administered lands.

[b] Cathedral AUMs are about 83 percent on BLM and 17 percent on National Park lands. This table shows only BLM AUMs.

[c] BLM and NRA AUMs only, based on the soil-vegetation inventory and monitoring studies. National Park AUMs would have to be added to these should grazing be continued. Proposals in all alternatives assume grazing would be eliminated on National Park lands.

[d] Hartnet AUMs are about 35 percent on BLM and 65 percent on National Park lands. This shows only BLM AUMs.

[e] Sandy 1 AUMs are about 77 percent on BLM and 23 percent on National Park lands. This shows only BLM AUMs.

[f] Sandy 3 AUMs are about 31 percent on BLM and 69 percent on National Park lands. This shows only BLM AUMs.

[g] Waterpocket AUMs are about 95 percent on BLM and NRA and 5 percent on National Park lands. This shows only BLM and NRA AUMs.

[h] Totals do not include 3,556 AUMs active preference and 2,037 AUMs average licensed use for livestock in Capitol Reef National Park.

[i] Total reservations for big game were 7,200 AUMs; however, BLM proposes to provide for existing numbers of burros.

[j] Allotment classification: M - Maintain, I - Improve, C - Custodial. See also Chapter 1, Table 1-2. Unallotted areas would be in the Maintain category.

TABLE 2-4

Proposed Rangeland Improvements for Alternatives C, O, and E[a]

| Allotments | Grazing Systems[b] | Land Treatments[c] Acres | Land Treatments[c] Additional AUMs | Rangeland Developments: Springs Redev. | Springs New | Reservoirs Recon. | Reservoirs New | Pipelines (miles) | Troughs | Vertical Wells | Horizontal Wells | Corral | Fences (miles) | Cattle Guards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue Bench | Continue | 0 | 0 | -- | -- | 4 | 2 | -- | -- | -- | -- | -- | -- | -- |
| Bullfrog | Continue | 2,000[d] | 250[d] | -- | 2 | 4 | 1 | 12 | 6 | -- | -- | -- | -- | -- |
| Burr Point | Continue | 0 | 0 | -- | 1 | 2 | 3 | 10 | 8 | 2 | -- | -- | -- | -- |
| Cathedral | Implement | 0 | 0 | -- | -- | 4 | 2 | -- | -- | -- | -- | -- | -- | -- |
| Cedar Point | Continue season-long | 0 | 0 | -- | 2 | 4 | 5 | -- | 4 | -- | 2 | -- | -- | -- |
| Crescent Creek | Continue | 1,700[d]<br>1,100[e] | 240[d]<br>160[e] | 1 | -- | -- | -- | 1 | 2 | -- | -- | -- | 3 | -- |
| Hanksville | Implement | 0 | 0 | -- | 1 | 3 | 5 | 1 | 4 | 2 | -- | -- | 10 | -- |
| Hartnet | Continue | 0 | 0 | -- | -- | 4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Nasty Flat | Implement | 1,200[d] | 224[d] | -- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | -- |
| North Bench | Continue | 0 | 0 | -- | -- | 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Pennell | Continue | 4,100[d]<br>1,400[e] | 600[d]<br>200[e] | -- | 3 | -- | 1 | 1 | 4 | -- | -- | -- | 1 | -- |
| Robbers Roost | Implement | 0 | 0 | -- | -- | 2 | 7 | -- | -- | -- | -- | -- | -- | -- |
| Rockies | Continue | 4,000[d] | 306[d] | 1 | 2 | 8 | 3 | -- | 5 | 2 | -- | -- | 1 | -- |
| Sandy 1 | Continue season-long | 0 | 0 | -- | -- | 3 | 4 | -- | -- | -- | -- | -- | 1 | 1 |
| Sandy 2 | Continue | 1,300[d] | 150[d] | -- | 1 | 2 | 3 | -- | 1 | -- | -- | -- | -- | -- |
| Sandy 3 | Continue season-long | 0 | 0 | -- | -- | 3 | -- | -- | -- | -- | -- | 1 | -- | -- |
| Sawmill Basin | Implement | 750[d]<br>500[e] | 110[d]<br>40[e] | -- | 1 | -- | 1 | -- | 1 | -- | -- | -- | -- | -- |
| Sewing Machine | Continue season-long | 0 | 0 | -- | 1 | 7 | 3 | -- | 1 | -- | -- | -- | -- | -- |
| Steele Butte | Implement | 4,000[d] | 480[d] | -- | 1 | 1 | 7 | -- | 1 | -- | -- | -- | -- | -- |
| Trachyte | Implement | 600[d] | 75[d] | -- | -- | 2 | 5 | 5 | 2 | -- | -- | -- | -- | 1 |
| Waterpocket | Implement season-long | 0 | 0 | 1 | -- | 3 | 6 | -- | 1 | -- | -- | -- | -- | -- |
| Wild Horse | Continue | 0 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | | 22,650 | 2,835 | 3 | 15 | 57 | 58 | 31 | 41 | 6 | 2 | 1 | 16 | 2 |
| Total Big Game | | 3,000[e] | 400[e] | | | | | | | | | | | |
| Total Livestock | | 19,650[d] | 2,435[d] | | | | | | | | | | | |
| Unallotted Areas | | | | | | | | | | | | | | |
| Ory Lakes | No grazing | 1,300[e] | 160[e] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Flint Trail | f | 0 | 0 | -- | -- | 2 | 2 | -- | -- | -- | -- | -- | -- | -- |
| Little Rockies | No grazing[g] | 0 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| North Caineville Mesa | No grazing | 0 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| South Caineville Mesa | No grazing | 0 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total Big Game | | 1,300[e] | 160[e] | | | | | | | | | | | |
| Total Livestock | | 0 | 0 | | | | | | | | | | | |
| GRAND TOTAL | | 23,950 | 2,995 | 3 | 15 | 59 | 60 | 31 | 41 | 6 | 2 | 1 | 16 | 2 |
| No. of Allotments | | 10 | 10 | 3 | 10 | 18 | 17 | 7 | 14 | 3 | 1 | 1 | 5 | 2 |

[a]Under Alternative C, all AUMs on Crescent Creek (240), Nasty Flat (224), Pennell (600), Sawmill Basin (110), Ory Lakes (160), plus two/thirds of the AUMs developed on the remaining allotments, and interseeding (totaling 2,577) would be allotted to big game. The remaining 41B would be allotted to livestock. Under Alternative O, livestock would be allotted all AUMs developed from land treatments (except for the Ory Lake interseeding), totaling 2,B35 AUMs. Big game would be allotted 160 AUMs.

[b]Proposals include: Continue present grazing system; Implement a new grazing system; Implement or Continue Season-Long grazing; and No Grazing of livestock.

[c]Proposed land treatments include chain and seed, plow and seed, contour and seed, burn and seed, spray, burn only, seed only, and interseed with forbs.

[d]Primary value for livestock in Alternative E.

[e]Primary value for big game in Alternative E. Involves interseeding with forbs and/or browse, as needed.

[f]Although Flint Trail Allotment has no grazing scheduled, it could be used on a temporary, as-needed basis for livestock grazing while other allotments were being rehabilitated or in an emergency situation.

[g]Little Rockies Allotment would only be grazed in the side canyons of North Wash by six bulls.

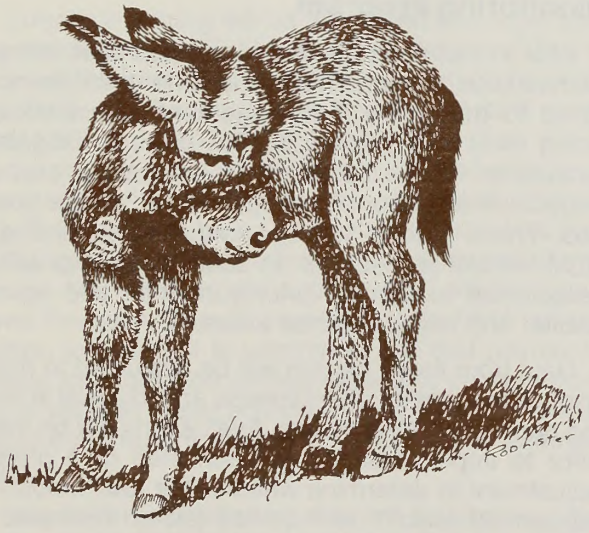
## Alternative C: Manage for Optimum Big Game Production

This alternative is based on the MFP Step 1 recommendations developed by range-wildlife specialists to optimize big game production on the public lands. Management goals would be to enhance wildlife habitat.

Forage use for big game and livestock would be consistent with the grazing capacity based on the recent soil-vegetation inventory and ongoing rangeland monitoring studies. Big game would be given priority in forage use on currently identified crucial ranges. Initially, forage would be provided for prior stable numbers of deer and long-term management goal numbers of bison, antelope, and bighorn sheep, as determined by UDWR. Forage for existing numbers of wild burros would also be provided. Adjustments would be made in livestock use to accommodate increased numbers of big game.

Under this alternative, proposed forage use on BLM and NRA lands would be as follows:

| | |
|---|---|
| Livestock | 39,804 AUMs |
| Bison | 3,768 AUMs |
| Deer | 6,127 AUMs |
| Antelope | 960 AUMs |
| Bighorn Sheep | 3,968 AUMs |
| Burros | 100 AUMs |



See Table 2-2 for forage use by allotment.

Long-term increases in forage would be allocated according to the following priorities:

1. Provide sufficient forage to meet or exceed UDWR's prior stable numbers for deer and long-term management goals for bison, antelope, and bighorn sheep.

2. Allow livestock numbers to increase to utilize all available non-competitive forage.

BLM and UDWR personnel have discussed the possibility of re-establishing beaver to their former range in the Henry Mountains. The prime area identified is Mt. Ellen Creek, a tributary of Bull Creek. Another transplant area is being considered at the headwaters of Bullfrog Creek.

## Alternative D: Manage for Optimum Livestock Production

This alternative is based on the MFP Step 1 recommendations developed by range-livestock specialists to optimize livestock production on public lands. Management goals would be to increase the forage available to livestock through intensive grazing management and rangeland improvements.

Livestock would be given priority in forage use. Level of use would be adjusted to the estimated grazing capacity, based on the recent soil-vegetation inventory and ongoing rangeland monitoring studies. Forage would be provided for existing numbers of wild burros. Forage would be provided for current numbers of deer and antelope; non-competitive forage would be given to bighorn sheep. Forage would not be provided for bison, and they would be removed.

Under this alternative, proposed forage use on BLM and NRA lands would be as follows:

| | |
|---|---|
| Livestock | 59,528 AUMs |
| Bison | 0 AUMs |
| Deer | 2,323 AUMs |
| Antelope | 87 AUMs |
| Bighorn Sheep | 2,336 AUMs |
| Burros | 100 AUMs |

See Table 2-2 for forage use by allotment.

Long-term increases in forage would be allocated according to the following priorities:

1. Provide sufficient livestock forage to meet or exceed active preference.

2. Provide non-competitive forage to big game.

## Alternative E: Preferred Alternative—MFP Step 2 Planning Recommendation

This alternative was developed through BLM's planning process (see Table 2-1). It is based on the recommendations of an interdisciplinary team and is a com-

promise between competing resource uses. The forage available for livestock and big game was determined using data from the soil-vegetation inventory and ongoing rangeland monitoring studies. Under this alternative, changes in livestock periods and/or patterns of use are proposed on certain allotments to enhance rangeland productivity or to correct situations causing adverse impacts on watershed or vegetation.

Proposed forage use on BLM and NRA lands would be as follows:

| | |
|---|---|
| Livestock | 50,487 AUMs |
| Bison | 2,088 AUMs |
| Deer | 5,641 AUMs |
| Antelope | 695 AUMs |
| Bighorn Sheep | 3,930 AUMs |
| Burros | 100 AUMs |

See Table 2-2 for forage use by allotment.

Beaver are proposed to be transplanted into the headwaters of Mt. Ellen Creek, Bull Creek, and at the head of Bullfrog Creek.

Long-term increases in forage would be allocated according to the following priorities:

1. Restore active preference suspended by the initial action.

2. Meet UDWR's prior stable numbers for deer and long-term management goals for bison, antelope, and bighorn sheep.

# ADMINISTRATIVE FEATURES COMMON TO ALTERNATIVES

## Implementation Program

BLM personnel and affected permittees will develop Allotment Management Plans (AMPs) to implement the grazing management program. If BLM personnel and permittees fail to reach an agreement, an AMP that protects resources will be implemented by decision of the area manager. The permittee will, however, have the right to appeal any such decision.

Livestock grazing levels and recommended patterns of use will be specified in the individual AMPs, as will BLM's and range users' responsibilities for developing and maintaining rangeland improvements and monitoring programs. Each AMP will be implemented by the area manager and livestock permittee as it is completed.

Details of the selected alternative(s) will be further refined and specifically matched to resource conditions during preparation of AMPs. Proposed rangeland improvements could vary from those described at this stage of planning. Significant changes (locations, scale, etc.) would be subject to site-specific environmental assessment prior to implementation/construction.

## Monitoring Program

After implementation of the selected alternative or combination of alternatives, all allotments will be monitored to determine if management objectives are being met. Four primary studies basic to rangeland evaluation will be used: (l) actual grazing use; (2) vegetation utilization; (3) trend; and (4) climate analyses. These studies will be conducted according to BLM Manual procedures. In addition, studies will be established to monitor priority riparian and aquatic habitat and key watershed areas.

Data from these studies will be evaluated to determine management effectiveness and to assist in making necessary adjustments. Evaluations will be made prior to implementation of each step of a phased adjustment to determine whether the total amount of adjustment should be modified (either increased or decreased) (43 CFR 4110.3-2(e)). Each allotment will be evaluated at the end of the second and fourth years and at the conclusion of each grazing cycle. Management will be modified if evaluations determine that specific allotment objectives are not being achieved. Administrative modifications could include changes in livestock patterns of use, livestock numbers, periods of use, rangeland improvements, or a combination of these.

## Implementation Schedule

Within 5 months of publication of the Final Environmental Impact Statement (EIS), the Richfield District Manager and Henry Mountain Resource Area Manager will issue the Record of Decision/Rangeland Program Summary. This document will summarize, by allotment, management decisions and planned actions.

The priority for implementation of the grazing management program will follow the guidelines stated in the BLM Grazing Management Policy. Generally, decisions for allotments in the Maintain Category will be made within 9 months, Custodial Category within 12 months, and Improve Category within 17 months after publication of the Final EIS. Allotments in the Improve Category will have priority for development or revision of AMPs to resolve identified problems. Maintain and Custodial Category allotments will be second and third priority, respectively. The same priority will apply to appropriation of funds for rangeland improvements.

## Grazing Administration Practices

The selected management options from the alternative(s) will be administered and managed using standard BLM operating procedures. Each livestock permittee will be issued temporary grazing authorizations or term permits through the BLM Hanksville Area Office. These will specify the allotment, proposed forage use, period and/or pattern of use, numbers, and kinds of livestock.

Livestock grazing will be monitored and supervised by permittees and BLM throughout the year. Marking of livestock (preferred methods are ear tagging or dye marking) may be required to monitor livestock movement and proper stocking levels. Permittees will be required to request, in writing, any desired changes in use prior to the grazing period, since such changes could be inconsistent with management objectives. Grazing use outside the limits of the selected alternative(s) and without prior authorization will be considered trespass. Should trespass occur, BLM will take action to ensure it is eliminated and that payment is made for vegetation consumed and/or damage done. BLM will also make adjustments in the grazing management program during drought or other emergencies.

Vegetation utilization studies will be used to determine when the desired grazing level has been reached. The action described in the Monitoring section of this chapter will be used to adjust grazing use.

Administrative adjustments could be made to:

1. Authorize the movement of livestock from one pasture to another ahead of schedule if forage were lacking in the first pasture and available in the second.

2. Reduce livestock numbers temporarily if forage production were less than normal.

3. Increase livestock numbers on a temporary non-renewable basis if there were an abundance of available forage.

4. Adjust livestock use to limit utilization of key plant species to a predetermined level (e.g., 50 percent). Livestock use could be increased, decreased, or eliminated from an allotment to control utilization of key plant species. Rangeland condition, competition between big game and livestock, amount of available forage and water, and time of year will be considered in any decision to move livestock. Such adjustments will be designed to accomplish grazing management objectives.

## Standard Design, Construction, and Operation Features

The following protective measures will be required as standard procedures:

1. No permanent trails or roads will be constructed to project sites. Existing access will be used. Soil disturbance at all projects will be held to a minimum.

2. No vegetation clearing of project sites will be allowed except as authorized by the appropriate Federal official.

3. If necessary, disturbed areas will be reseeded to provide ground cover and minimize soil losses.

4. Site factors such as slope, precipitation, exposure, soil depth, seeding suitability, and erosion hazard will be criteria used in selecting sites for land treatments.

5. A survey of potential habitat for threatened or endangered species (including any sensitive species under consideration for formal designation as threatened or endangered) will be made prior to taking any action that could affect these species. Should BLM determine that there might be an effect on listed species, formal consultation with the Fish and Wildlife Service (FWS) will be initiated.

6. Cultural surveys and clearances will be required for all project sites (as specified in BLM Manual 8111.14) prior to new construction. BLM has entered into a memorandum of understanding with the Utah State Historic Preservation Officer regarding protection of cultural resources (see Appendix 1).

7. An environmental assessment (EA) will be required prior to ground-disturbing actions if significant modification of actions described in this EIS


occur or if resource information becomes available that indicates a need for further examination. The EA would be written to conform with BLM policy, would be site specific, and would supplement this EIS.

8. On allotments receiving land treatment, grazing by livestock will not be allowed until vegetation becomes well established. Two to five complete growing seasons with no livestock grazing will be required for burned or sprayed areas, and 2 full years of rest will be required for areas receiving ground-disturbing projects (e.g., chaining).

9. Water developments will be periodically inspected to ensure that they remain in useable condition. Preventive maintenance will be performed as needed. Cooperative agreements with rangeland users will be solicited by BLM for rangeland improvements, and these agreements will outline specific project maintenance responsibilities.

10. When possible, water for wildlife will be maintained throughout the year at established watering facilities.

11. The appropriate Federal officials will be notified if paleontological remains are encountered during any land treatment or construction activities. Recovery, protection, and preservation measures will be implemented, as necessary, to mitigate adverse impacts.

12. Riparian areas proposed to protect wildlife habitat, aesthetics, and water quality will be fenced. Fencing of riparian areas will be completed as a need is recognized during AMP development.

13. Prior to the development of projects, provisions of the Memorandum of Understanding of April 1, 1979 between the BLM, Forest Service (FS), UDWR, and Soil Conservation Service (SCS) and the master Memorandum of Understanding between BLM and UDWR of June 1979 will be met. These memoranda provide for coordination in the development and establishment of guidelines for buffer zones for water and other developments.

Features specifically applicable to the proposed rangeland improvements are summarized in Table 2-4. The criteria and methodology used to select the proposed rangeland improvements are presented in the Vegetation section of Chapter 4.

## COMPARATIVE SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-5 summarizes and compares the major environmental consequences of the alternatives. (See Chapter 4 for a detailed discussion of the impacts of each alternative.)

TABLE 2-5

Comparative Summary of Impacts, Irreversible/Irretrievable Commitment of Resources[a] and Relationship of Short-Term Use of the Environment to Long-Term Productivity

| Resource[b] | Alternative A: Proposed Action--No Change | Alternative B: No Action | Alternative C: Optimize Big Game | Alternative D: Optimize Livestock | Alternative E: Preferred Alternative--Planning Recommendation | Relationship Between Short-Term Use of the Environment and Long-Term Productivity |
|---|---|---|---|---|---|---|
| Vegetation | Vegetation/trend in ecological condition would decline on 18 percent of the area because of vegetation overutilization. Condition of riparian zones in this area would remain poor. Decreased forage production would be reversible, but forage production lost until vegetation recovered would be irreplaceable. | Vegetation/trend in ecological condition would progressively decline on 56 percent of the area because of vegetation overutilization. Condition of riparian zones in this area would also continue to decline. Decreased forage production would be reversible, but forage production lost until vegetation recovered would be irreplaceable. | Vegetation/trend in ecological condition would generally improve throughout the area. Land treatments would increase available forage by 2,955 AUMs. Riparian areas in the Henry Mountains would improve because of elimination of livestock use on four allotments. | Vegetation/trend in ecological condition would generally improve throughout the area. Land treatments would increase available forage by 2,955 AUMs. Riparian areas would remain in present condition. | Vegetation/trend in ecological condition would generally improve throughout the area. Land treatments would increase available forage by 2,955 AUMs. Improved management has a potential for improvement of riparian condition. | The decline in ecological condition under Alternatives A and B would continue as long as vegetation overutilization occurred. Recovery would, depending on the site, take from a few years to several decades. Generally, the rangelands would improve in forage production and condition as land treatments were implemented and AMPs were developed in Alternatives C, D, and E. |
| Soils | Increased erosion would occur on portions of 12 allotments because of vegetation overutilization. Increased erosion would be reversible, but soil lost would be irreplaceable. | Increased erosion would occur on portions of 22 allotments (56 percent of the area) because of vegetation overutilization. Increased erosion would be reversible, but soil lost would be irreplaceable. | Land treatments on ten allotments would cause temporary increased erosion on 23,950 acres; however, these treatments would result in reduced erosion in the long term. Soil lost as a result of land treatments would be irreplaceable. | Same as Alternative C. | Same as Alternative C. | Under Alternatives A and B, increased erosion could cause a loss of soil productivity extending through the long term. Under Alternatives C, D, and E, temporary increases in erosion would result; however, these increases would be reduced in the long term. |
| Water | Surface water quality would be degraded by higher sediment yield on portions of 12 allotments because of overgrazing. Degraded water quality could be reversed; however, losses until water quality was improved would be irretrievable. | Surface water quality would be degraded by higher sediment yield on portions of of 22 allotments because of vegetation overutilization. Degraded water quality could be reversed; however, losses until water quality was improved would be irretrievable. | There would be a temporary reduction in surface water quality because of higher sediment yield on ten allotments receiving land treatments. However, in the long term sediment yield would decline. Thus, there would be no irreversible impacts; however, the temporary degradation of water quality would be irretrievable. | Same as Alternative C. | Same as Alternative C. | Under Alternatives A and B, increased sediment yield would cause a long-term degradation in water quality. Under Alternatives C, D, and E, temporary water quality degradation would result; however, this degradation would be reduced in long term. |
| Animal Life<br>Mule Deer | No impacts. | Deer numbers would decline because of increased competition for forage. The decline would be reversible, but animals and their offspring lost would be irretrievable. | Deer numbers would increase, although prior stable numbers would not be reached. | Deer numbers could decline slightly in the long term because of increased competition for forage. The decline would be reversible, but animals lost would be irretrievable. | Initial increased competition for forage could cause a decline in numbers until additional AUMs from proposed land treatments were available. Then deer number would be expected to increase over current levels, both in the short and long terms. Any animals lost in the initial period would be irretrievable. | Forage use levels to livestock in Alternatives B and D would lead to a decline in deer numbers over both the short and long terms. The increased forage use level to big game under Alternatives C and E would result in an increase in deer numbers over both the short and long terms. |
| Bison | In the long term, bison numbers would decline because of competition for forage on two allotments containing crucial bison range. Dverutilization would occur on Dry Lakes. No change is expected in the short term. The decline would be reversible, but animals lost would be irretrievable. | Bison numbers would decline in the long term because of competition for forage on nine allotments containing crucial bison range. The decline would be reversible, but animals lost would be irretrievable. | Bison numbers would increase from 200 to 450 mature animals as livestock was reduced and vegetation was developed. | Bison would be eliminated. The loss would be irreversible, unless transplants from other areas occurred. The animals eliminated would be irretrievable. | Bison numbers would decrease slightly from current levels. The decrease would be reversible, but animals lost would be irretrievable. | Forage use levels to livestock under Alternatives A, B, D, and E would lead to a decline of or elimination of bison numbers over both the short and long terms. The increased forage use level to big game under Alternative C would result in an increase in bison numbers over both the short and long terms. |
| Antelope | No impacts. | Antelope would be eliminated. The loss would be irreversible, unless animals were transplanted from other areas. The animals eliminated would be irretrievable. | Antelope numbers would increase approximately 400 percent in the long term. However, UDWR's long-term management goal would not be reached. | Same as Alternative A. | Antelope numbers would increase approximately 270 percent in the long term. However, UDWR's long-term management goal would not be reached. | Forage use levels to big game under Alternatives C and E would lead to an increase in antelope numbers over both the short and long terms. Under Alternative B, forage use levels would not include antelope, and they would, therefore, be eliminated. |
| Desert Bighorn Sheep | No impacts. | Bighorn sheep would be eliminated. The loss would be irreversible, unless animals were transplanted from other areas. The animals eliminated would be irretrievable. | Bighorn sheep numbers could reach UDWR's long-term management goal. | Bighorn sheep could be eliminated because of the increase in livestock use, especially domestic sheep. If eliminated, the loss would be irreversible unless animals were transplanted from other areas; animals lost would be irretrievable. | Bighorn sheep numbers would be expected to increase. However, UDWR's long-term management goal would not be met. | Replacement of the population (Alternative B and possibly D) would require several years. Individual animals and their offspring could not be replaced except by reintroduction. |
| Visual Resources | On four allotments (5 percent of the area), overgrazing could affect visual resources in highly scenic, visually sensitive areas. | Vegetation overutilization on 14 allotments (47 percent of the planning area) would cause progressive deterioration of visual resources along the major travel routes and in highly scenic areas. | Rangeland improvements on 17 allotments and overgrazing on one allotment would affect scenic values and violate VRM management class objectives. The principal areas of impact would be Mts. Ellen and Pennell, the areas rated highest in scenic quality. | Same as Alternative C | Same as Alternative C. | Any modification to the visual quality of the area would last into the long term. |

TABLE 2-5 (continued)

| Resource[b] | Alternative A: Proposed Action--No Change | Alternative B: No Action | Alternative C: Optimize Big Game | Alternative O: Optimize Livestock | Alternative E: Preferred Alternative--Planning Recommendation | Relationship Between Short-term Use of the Environment and Long-Term Productivity |
|---|---|---|---|---|---|---|
| Wilderness[c] | On portions of four allotments, impacts caused by grazing could violate BLM Interim Management Policy (IMP) non-impairment criteria in two wilderness study areas (WSAs) and an area under appeal. | Increased forage utilization caused by grazing on portions of 12 allotments could violate IMP non-impairment criteria in five WSAs. | Vegetation overutilization caused by grazing on portions of one allotment could violate IMP non-impairment criteria in one WSA. Proposed rangeland improvements on 12 allotments would have to be designed and constructed to meet non-impairment criteria in the five WSAs affected. | Proposed rangeland improvements on portions of 12 allotments would have to be designed and constructed to meet non-impairment criteria in five affected WSAs. | Same as Alternative C | Overgrazing could violate IMP non-impairment criteria in the affected WSAs over the long term. Proposed rangeland improvements would have to be designed and constructed to meet non-impairment criteria. |
| Recreation | On four allotments, vegetation over-utilization would affect primitive and sightseeing values and one developed campground in the long term. | On 12 allotments, vegetation overutilization would cause progressive degradation of sightseeing, big game hunting, and primitive values. Facilities and recreation values would be impacted by increased numbers of cattle on one unfenced developed campground. Elimination of bighorn sheep and antelope would adversely affect wildlife sightseeing values. Degradation of hunting and sightseeing values could be reversed; opportunities/values lost would be irretrievable. | Rangeland improvements on 17 allotments would affect sightseeing and primitive values. Numbers of bison, deer, antelope, and bighorn sheep would increase, resulting in improved hunting and sightseeing values. | Elimination of the bison herd would adversely impact sightseeing and hunting values. Rangeland improvements on 17 allotments would adversely affect primitive and general sightseeing values. In the long term, bighorn sheep numbers would decrease and impact sightseeing values. | Rangeland improvements on 17 allotments would affect sightseeing and primitive values. Numbers of deer, antelope, and bighorn sheep would increase and improve hunting and sightseeing values. | The recreational potential of the area would decrease over both the short and long terms as a result of all alternatives. |
| Cultural Resources | No impacts. | No impacts. | Ground disturbance during construction of rangeland improvements could inadvertently destroy or damage cultural resources. This loss of scientific and educational information would be irreversible and irretrivable. | Same as Alternative C. | Same as Alternative C | Intensive cultural resource inventories prior to any ground-disturbing actions would identify previously unknown sites and areas and increase knowledge of the resources. Inadvertent damage to sites could result from ground-disturbing actions. All impacts would last into the long term. |
| Livestock Grazing | All permittees would receive reductions in active preference averaging 53 percent. Overutilization on five allotments would, in time, cause decreases in livestock productivity. | Although permittees would not receive reductions in active preference, over-utilization by 9,231 AUMs on 16 allotments and the resultant decline in available forage would, in time, cause decreases in livestock productivity. Increased use would increase costs of rangeland development maintenance. Area-wide use would increase by 29,955 AUMs on 21 allotments. | Forty-three permittees would receive reductions in active preference. These include: nine permittees affected by elimination of cattle use on four allotments and sheep use on two other allotments. Two of these permittees would receive increases on other allotments. Use on eight allotments would increase. Area-wide livestock use would increase by 13,173 AUMs (49 percent). | Active preference increases on eight allotments would affect 29 permittees; decreases on 13 allotments would affect 38 permittees. Overall, 21 permittees would receive active preference increases; 30 would receive reductions; and eight would receive increases and decreases on different allotments. Livestock use would increase by 32,951 AUMs (224 percent). Sheep use would increase approximately 42 times present average use, affecting four permittees. | Forty permittees would receive reductions in active preference; 14 would receive increases; and five would receive increases and decreases on different allotments. Overall, livestock use would increase by 23,854 AUMs. | There would be initial reductions in active preference under Alternatives C, O, and E; however, use would increase substantially in both the short and long terms. The level of use could be sustained indefinately. Under Alternative B, use would increase to levels that could not be sustained without declines in livestock productivity on 16 allotments. |
| Socioeconomics | Reductions in active preference would reduce average ranch capital values as follows: small, -$3,660; medium, -$14,720; large, -$23,540. Because grazing would remain at existing levels, ranch income would not change, nor would regional economic impacts be expected. Loss of capital values would be reversible, but any actual losses would be irretrievable. | Increased use would increase income to the permittees and and the region. In the long term, however, overgrazing would result in losses in income because of vegetation overutilization and lack of rangeland improvements which would force the permittees to reduce livestock numbers. Resulting economic losses would be reversible, but any actual losses would be irretrievable. | For those permittees receiving reductions in active preference, average ranch capital values would decline as follows: small, -$2,200; medium, -$9,300; large, -$13,680. Overall, increases in livestock use and income would benefit the permittees and the regional economy. Loss of capital values could be reversed, but any actual losses experienced would be irretrievable. | For those permittees receiving reductions in active preference, average ranch capital values would change as follows: small, -$900; medium, -$2,960, large, +$1,620. Overall, increases in livestock use and income would benefit the permittees and regional economy. Loss of capital values could be reversed, but any actual losses experienced would be irretrievable. | For those permittees receiving reductions in active preference, average ranch capital values would decline as follows: small, -$1,720; medium, -$5,240; large, -$4,180. Overall, increases in livestock use and income would benefit the permittees and regional economy. Loss of capital values could be reversed but any actual losses experienced would be irretrievable. | Losses incurred could not be recovered. |

[a] Irreversible/irretrievable commitment of resources, if any were identified, are listed under the resource/alternative.

[b] None of the alternatives would have impacts on climate, air quality, geology, aquatic wildlife, or land use plans.

[c] Legally proposed actions which would violate IMP non-impairment criteria could not be taken. Such actions would have to be delayed until Congress decides which WSAs to include in the National Wilderness Preservation Systems.

# CHAPTER 3
# AFFECTED ENVIRONMENT

## INTRODUCTION

This chapter describes the affected environment of the Henry Mountain Planning Area. It provides the basis for evaluating impacts of the proposed action and alternatives analyzed in Chapter 4. Descriptions presented here are commensurate with the significance of impacts under the proposed action or alternatives and discussions required by law (e.g., threatened and endangered species).

The primary sources for information presented in this chapter are the documents developed during the Bureau of Land Management (BLM) planning process (Unit Resource Analysis [URA], Planning Area Analysis [PAA], and Management Framework Plan [MFP]).

None of the alternatives would have significant effects on climate, air quality, or geology; however, these are briefly discussed to describe the area's setting. Following this discussion are descriptions of vegetation, soils, water resources, animal life, visual resources, wilderness, recreation, cultural resources, land use plans, livestock grazing, and socioeconomics.

## THE SETTING

The planning area is located along the western edge of the Colorado Plateau physiographic province. Six basic landforms comprise the area: canyons, sand deserts, hogback ridges, badlands with mesas, mountains, and piedmont gravel benches (Hunt et al., 1953).

Elevations vary from 3,700 feet, along the shores of Lake Powell, to 11,615 feet above mean sea level on Mount Ellen. Colorado, Dirty Devil, Fremont, and Muddy Creek are the major rivers. All drainages are tributary to the Colorado River.

Climatic variations correlate to differences in elevation. Lower elevations are characterized by aridity with less than 5 inches of precipitation at Hanksville, while areas in the Henry Mountains average over 30 inches of precipitation annually. The meager amount of precipitation at lower elevations is caused by the rainshadow effect of the high plateaus located west of Capitol Reef National Park. Wide daily and annual variations in temperature (Hanksville [4,456-foot elevation] January mean average 25° F; July mean average 79° F) and well-defined seasons are typical.

Air quality has been designated as Class II by the U.S. Environmental Protection Agency (EPA). This classification permits moderate deterioration which normally accompanies well-controlled growth. Two Class I areas border the planning area: Capitol Reef National Park on the west and Canyonlands National Park on the east. Class I areas are those in which practically any air quality deterioration would be considered significant. Regional concentrations of sulfur dioxide ($SO_2$), total suspended particulates (TSP), and nitrogen oxides (NOx) are generally well below the National Ambient Air Quality Standards (Environmental Research and Technology, Inc., 1977). No major air pollution sources are found, nor have polluted airsheds been identified within the planning area.

## VEGETATION

Vegetation diversity is high. A wide range in elevation and precipitation allows development of vegetation types from nearly all the major vegetational zones of Utah. Only creosote bush and alpine tundra zones are absent. About 725 taxa (about 700 species) in 317 genera and 76 families have been recorded for the Henry Mountain structural basin. Floristically, the planning area lies within the Canyonlands section of the Colorado Plateau division of the Great Basin (Neese, 1981).

There are seven major altitudinal vegetation zones that occur between the top of Mt. Ellen at 11,615 feet and the surface of Lake Powell at 3,700 feet, a range in elevation of 8,000 feet. The major vegetation zones can be broken down into vegetation types (Table 3-1) for characterizing condition and production potential.

### Major Vegetation Zones

#### WARM-DESERT SHRUB ZONE

This vegetation zone occurs in the lowest, warmest, and generally driest areas. It is transitional between the creosote bush communities, common to the Mojave Desert, and the cool-desert shrub communities common throughout most of the Great Basin. This zone is best developed on the deserts below 5,000 feet to the east and south of the mountains, where soils derived from sandstone strata are well drained and tend to be non-saline.

#### COOL-DESERT SHRUB ZONE

This vegetation zone is the largest in the planning area and also in the Mountain West. It includes vegetation types developed on fine-textured and well-drained saline to neutral soils between 5,000- and 7,000-foot elevations. This zone interfingers with the warm-desert shrub below and the pigmy forest above.

Galleta

Because of the different soils and environments (i.e., badlands, low mesas, deserts, washes, alluvial fans, saline seeps, and streams), the cool-desert shrub zone is the most complex of the zones in the planning area. Within the cool-desert shrub zone, there are several more or less well developed distinct communities, including shadscale, mat atriplex, greasewood, cottonwood, saltgrass, salt marsh, big rabbitbrush, galleta-three awn grassland, and little rabbitbrush-mixed desert shrub.

### PIGMY FOREST ZONE

The pigmy forest or pinyon-juniper woodland occurs mostly between 6,000 and 8,000 feet in areas receiving above 12 inches of annual precipitation. In the Henry Mountains, this zone covers the foothills between the deserts and the higher montane communities, forming a distinct band of trees, often with little or no understory of shrubs and herbaceous plants.

Juniper is most common at lower elevations and pinyon pine enters the community at mid elevations, becoming co-dominant with juniper. Pinyon pine dominates the higher elevations. Big sagebrush is a common understory species throughout the zone. Transition to ponderosa pine or mountain brush at the upper limits is often gradual, with pinyon, juniper, scrub oak, ponderosa, aspen, and Douglas fir communities intermingled.

### PONDEROSA PINE-MOUNTAIN BRUSH ZONE

Ponderosa pine-mountain brush comprise two major vegetation types developing mostly between 8,000- and 9,000-foot elevations. However, the zone descends to 7,000 feet on north-facing drainages and is as high as 10,000 feet on the dry south slopes of Mt. Hillers and Mt. Pennell.

The scrub oak-mixed mountain brush community is dominated by Gambels oak, with the most extensive and uniform stands occurring as a broad band in the trough between Mt. Pennell and Mt. Hillers. Less extensive stands occur on the south slopes of Mt. Ellen on the northwest side of Mt. Pennell.

Ponderosa pine occupies somewhat rockier, steeper, and cooler sites and tends to form open forests of medium to tall trees. This community is extensively developed on Mt. Hillers, encircling the mountain and extending nearly to the summit on drier slopes. A comparable, although less extensive, zone occurs on Mt. Pennell.

### MONTANE ZONE

Altitudinal range of this zone is mostly between 8,500- and 10,500-foot elevations; the zones above 8,500 feet receive the highest annual precipitation. In most of the mesic drainages and in areas where snowbanks are long persistent, a dense mixed forest dominated by Douglas fir, white fir, and aspen has developed.

### SUBALPINE ZONE

This zone is well-developed only on Mt. Ellen and is comprised of two different vegetation types: the subalpine forest dominated by Engelmann spruce and subalpine fir, and a subalpine grassland dominated by species of blue grass and fescue. Limber pine occasionally occurs on rocky, exposed sites, and small groves of aspen occupy protected niches.

### ALPINE ZONE

The environment on the summit ridges of Mt. Ellen above 11,000-foot elevation exceeds the tolerance of alpine fir and Engelmann spruce. Alpine-type (tundra-like) vegetation occupies pockets of soil in boulder fields on ridges and steep slopes.

### RIPARIAN ZONE

Riparian zones are those areas associated with streams, lakes, and wet areas where plant communities are predominately influenced by their association with water. They are key areas for a wide variety of uses. Wildlife biologists have suggested that mountain riparian zones are critical habitats in maintaining viable populations of fish, birds, small and big game animals (Ames, 1977; Hubbard, 1977). These areas are extremely important in providing forage and water

TABLE 3-1

Vegetation Types

| ALLOTMENTS | Grass Acres | % | Perennial Forbs Acres | % | Greasewood Acres | % | Winterfat Acres | % | Shadscale Salt Bush Acres | % | Mixed Desert Shrub Acres | % | Sagebrush Rabbitbrush Acres | % | Sand Sage Acres | % | Mtn. Shrub Acres | % | Blackbrush Acres | % | Snakeweed Acres | % | Mormon Tea Acres | % | Broadleaf Trees Acres | % | Conifer Acres | % | Pinyon-Juniper Acres | % | Barren Acres | % | Annual Grasses Acres | % | Annual Forbs Acres | % | Total Acres |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0100 Blue Bench | 8,262 | 8 | -- | -- | 5,100 | 5 | -- | -- | 29,830 | 29 | 3,076 | 3 | 1,966 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | 1,510 | 1 | -- | -- | 397 | <1 | 3,324 | 3 | 39,191 | 38 | -- | -- | 9,968 | 10 | 102,624 |
| 0101 Bullfrog | 6,601 | 7 | -- | -- | 182 | <1 | -- | -- | 17,810 | 19 | 5,603 | 6 | 3,181 | 3 | 100 | <1 | -- | -- | 6,104 | 7 | 400 | <1 | 1,459 | 2 | 139 | <1 | -- | -- | 4,004 | 4 | 44,800 | 48 | -- | -- | 2,441 | 3 | 92,824 |
| 0102 Burr Point | 16,181 | 22 | -- | -- | 138 | <1 | -- | -- | 3,585 | 5 | -- | -- | 389 | <1 | 62 | <1 | -- | -- | 34,873 | 47 | -- | -- | -- | -- | -- | -- | 5 | <1 | 511 | 1 | 18,695 | 25 | -- | -- | 272 | <1 | 74,711 |
| 0600 Cathedral | 7,546 | 6 | -- | -- | 1,716 | 2 | -- | -- | 14,819 | 12 | 6,093 | 5 | 624 | 1 | 2,835 | 2 | -- | -- | -- | -- | -- | -- | 12,265 | 10 | -- | -- | -- | -- | -- | -- | 60,761 | 51 | -- | -- | 12,334 | 10 | 118,993 |
| 0103 Cedar Point | 3,984 | 7 | -- | -- | -- | -- | -- | -- | 2,998 | 5 | 6,361 | 11 | 287 | <1 | 41 | <1 | 1,812 | 3 | 25,895 | 45 | -- | -- | -- | -- | -- | -- | -- | -- | 394 | 1 | 14,273 | 25 | 374 | <1 | 1,603 | 3 | 58,022 |
| 0104 Crescent Creek | 967 | 10 | 175 | 2 | -- | -- | -- | -- | -- | -- | 5 | <1 | 1,070 | 11 | -- | -- | 915 | 9 | -- | -- | -- | -- | -- | -- | 66 | 1 | 1,087 | 11 | 4,317 | 44 | 1,101 | 11 | -- | -- | -- | -- | 9,703 |
| 0106 Ory Lakes | -- | -- | 468 | 4 | -- | -- | -- | -- | -- | -- | -- | -- | 993 | 9 | -- | -- | 340 | 3 | -- | -- | -- | -- | -- | -- | 546 | 5 | 693 | 7 | 7,247 | 67 | 482 | 5 | -- | -- | -- | -- | 10,769 |
| 0900 Flint Trail | 8,888 | 8 | -- | -- | -- | -- | -- | -- | 6,752 | 6 | 10,227 | 9 | 2,359 | 2 | 10 | <1 | -- | -- | 17,676 | 15 | 528 | <1 | 1,153 | 1 | -- | -- | -- | -- | 13,948 | 12 | 53,532 | 46 | -- | -- | 316 | <1 | 115,389 |
| 0107 Hanksville | 7,112 | 8 | 99 | <1 | 3,509 | 4 | -- | -- | 12,108 | 13 | 6,365 | 7 | 183 | <1 | 8,965 | 10 | 2,058 | 2 | 8,822 | 10 | -- | -- | 16,599 | 18 | 108 | <1 | -- | -- | 5,263 | 6 | 11,141 | 12 | -- | -- | 8,322 | 9 | 90,654 |
| 0603 Hartnet | 3,166 | 12 | -- | -- | 326 | 1 | -- | -- | 5,491 | 21 | 2,091 | 8 | 1,806 | 7 | 1,152 | 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10,780 | 41 | -- | -- | 1,452 | 6 | 26,264 |
| 0120 Little Rockies | 575 | 1 | -- | -- | -- | -- | -- | -- | 3,103 | 5 | 5,376 | 8 | 781 | 1 | -- | -- | -- | -- | 25,593 | 38 | -- | -- | -- | -- | -- | -- | -- | -- | 274 | <1 | 30,860 | 46 | -- | -- | 128 | <1 | 67,690 |
| 0108 Nasty Flat | 1,487 | 9 | 712 | 4 | -- | -- | -- | -- | 22 | <1 | -- | -- | 2,669 | 15 | -- | -- | 595 | 3 | -- | -- | -- | -- | -- | -- | 750 | 4 | 724 | 4 | 8,516 | 49 | 1,866 | 11 | -- | -- | -- | -- | 17,341 |
| 0610 North Bench | 2,661 | 10 | -- | -- | 199 | 1 | -- | -- | 2,064 | 8 | 553 | 2 | 191 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | 1,264 | 5 | -- | -- | -- | -- | -- | -- | 15,649 | 61 | -- | -- | 2,880 | 11 | 25,461 |
| 0700 North Caineville Mesa | 65 | 3 | -- | -- | -- | -- | -- | -- | 539 | 26 | 240 | 12 | -- | -- | -- | -- | 32 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,209 | 58 | -- | -- | -- | -- | 2,085 |
| 0109 Pennell | 3,459 | 5 | 54 | <1 | -- | -- | -- | -- | 252 | <1 | 24 | <1 | 3,275 | 5 | -- | -- | 8,351 | 13 | -- | -- | 11 | <1 | -- | -- | 473 | 1 | 7,394 | 12 | 30,586 | 48 | 9,357 | 15 | -- | -- | 18 | <1 | 63,254 |
| 0901 Robbers Roost | 36,261 | 18 | -- | -- | 89 | <1 | 138 | <1 | 1,324 | <1 | 3,451 | 2 | 2,286 | 1 | 5,651 | 3 | 3,058 | 1 | 32,330 | 16 | 1,804 | 1 | 9,386 | 5 | 82 | <1 | -- | -- | 31,832 | 15 | 72,501 | 35 | -- | -- | 5,736 | 3 | 205,929 |
| 0110 Rockies | 5,995 | 4 | -- | -- | 135 | <1 | -- | -- | 4,249 | 3 | 23,044 | 14 | 5,726 | 3 | -- | -- | 192 | <1 | 47,266 | 28 | 1,832 | 1 | 388 | <1 | 59 | <1 | 331 | <1 | 18,204 | 11 | 56,270 | 33 | 1,609 | 1 | 3,738 | 2 | 169,038 |
| 0111 Sandy 1 | 2,793 | 9 | -- | -- | 3,184 | 11 | -- | -- | 2,519 | 8 | 1,773 | 6 | 1,015 | 3 | -- | -- | -- | -- | -- | -- | -- | -- | 3,722 | 12 | -- | -- | -- | -- | 6,634 | 22 | 8,007 | 27 | -- | 1 | 500 | 2 | 30,147 |
| 0112 Sandy 2 | 2,286 | 4 | -- | -- | 5,454 | 10 | -- | -- | 5,032 | 9 | -- | -- | 567 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | 2,910 | 5 | -- | -- | -- | -- | 24,167 | 44 | 12,974 | 23 | -- | -- | 2,036 | 4 | 55,426 |
| 0113 Sandy 3 | 71 | 1 | -- | -- | 1,025 | 17 | -- | -- | 873 | 14 | -- | -- | 1,749 | 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,424 | 23 | 972 | 16 | -- | -- | -- | -- | 6,114 |
| 0114 Sawmill Basin | -- | -- | 1,015 | 10 | -- | -- | -- | -- | -- | -- | -- | -- | 206 | 2 | -- | -- | 592 | 6 | 451 | 5 | -- | -- | -- | -- | 712 | 7 | 2,066 | 21 | 4,107 | 42 | 655 | 7 | -- | -- | -- | -- | 9,804 |
| 0902 Sewing Machine | 11,359 | 9 | -- | -- | -- | -- | -- | -- | 14,129 | 11 | 6,659 | 5 | 380 | <1 | 132 | <1 | -- | -- | 28,149 | 22 | 292 | <1 | -- | -- | -- | -- | -- | -- | 12,259 | 9 | 55,957 | 43 | -- | -- | -- | -- | 129,316 |
| 0701 South Caineville Mesa | -- | -- | -- | -- | -- | -- | -- | -- | 95 | 2 | 1,672 | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 695 | 18 | 1,461 | 37 | -- | -- | -- | -- | 3,923 |
| 0115 Steele Butte | 1,487 | 2 | -- | -- | 122 | <1 | -- | -- | 19,991 | 24 | 1,752 | 2 | 1,702 | 2 | -- | -- | 915 | 1 | -- | -- | 1,650 | 2 | -- | -- | -- | -- | -- | -- | 35,083 | 42 | 20,741 | 25 | -- | -- | -- | -- | 83,443 |
| 0116 Trachyte | 2,730 | 5 | -- | -- | -- | -- | -- | -- | 2,408 | 4 | 3,976 | 7 | 740 | 1 | -- | -- | 86 | <1 | 31,193 | 53 | -- | -- | 83 | <1 | -- | -- | 312 | <1 | 3,756 | 6 | 12,042 | 20 | -- | -- | 2,071 | 3 | 59,397 |
| 0117 Waterpocket | 5,541 | 8 | -- | -- | -- | -- | -- | -- | 10,420 | 14 | 4,594 | 6 | 13 | <1 | 628 | 1 | -- | -- | 24,340 | 33 | 2,001 | 3 | 3,438 | 5 | 508 | <1 | -- | -- | 122 | <1 | 18,370 | 25 | 2,577 | 3 | 1,132 | 2 | 73,684 |
| 0613 Wild Horse | 3,352 | 5 | -- | -- | 730 | 1 | 957 | 1 | 11,966 | 18 | 4,202 | 6 | 2,543 | 4 | -- | -- | 651 | 1 | -- | -- | -- | -- | 7,033 | 11 | -- | -- | -- | -- | -- | -- | 31,851 | 48 | -- | -- | 2,875 | 4 | 66,160 |
| Total | 143,829 | 8 | 2,523 | <1 | 21,909 | 1 | 1,095 | <1 | 172,379 | 10 | 97,137 | 6 | 36,701 | 2 | 19,576 | 1 | 19,597 | 1 | 282,692 | 16 | 8,518 | 1 | 61,210 | 4 | 3,443 | <1 | 13,009 | 1 | 216,667 | 12 | 605,498 | 34 | 4,560 | <1 | 57,822 | 3 | 1,768,165 |

Vegetated 1,162,667 Acres 66 Percent
Barren 604,598 Acres 34 Percent

for domestic animals (Phillips, 1965; Cook, 1966). Watershed specialists have indicated that the riparian zone plays an integral role in water quantity and quality (Horton and Campbell, 1974). BLM is committed to protect and enhance riparian and wetland areas (BLM Manual 6740 and Executive Order 11990 [42 FR 26961]).

Riparian areas are often subject to impacts from users. Wildlife and livestock concentrate in these areas, creating a substantial impact on browse and herbaceous vegetation. Recreationists camp, picnic, fish, and hunt along streams, occasionally inflicting damage. Roads and logging activities can also greatly affect the riparian zone. Often the users which are so dependent on a riparian zone are also principal instruments of damage (Roath and Krueger, 1982).

Riparian zones occupy a relatively small but important part of the area. Vegetation surveys specific to riparian zones were limited to a relatively small number of sites. The soil-vegetation inventory identified and classified the ecological condition of riparian vegetation occupying small strips along major stream courses, intermittent streams, flood washes, and seeps and springs.

Of the 113 streams in the planning area, 46 have been surveyed. Streams surveyed comprised 14,353 acres of riparian vegetation. Of these, 5,607 acres (39.1 percent) are in good condition, 1,583 acres (11.0 percent) are in fair condition, and 7,163 acres (49.9 percent) are in poor condition. There is limited data available on the 67 unsurveyed streams.

## Threatened, Endangered, and Sensitive Plant Species

Much of the planning area is a harsh environment where conditions for plant growth are poor. Few plants are capable of becoming established and competition is limited. Such circumstances favor the evolution of rare and restricted plant species. Table 3-2 lists threatened, endangered, or sensitive plant species which are known or are likely to occur in the planning area, along with their known habitat, distribution, and current status. This table does not reflect an area-wide on-the-ground survey, and is, therefore, probably incomplete at this time. The only plant occurring within the planning area which is currently officially listed by the Fish and Wildlife Service (FWS) is *Sclerocactus wrightiae*, or Wright's fishhook cactus. This plant is listed as endangered.

## Current Ecological Stage, Forage Production, and Potential

Livestock were first introduced in the period of 1881 to 1900. Heavy, unregulated grazing use by cattle and sheep led to a striking alteration of native vegetation and an increase of spiny, unpalatable or poisonous plant species (Stanton, 1931). With the resulting reduction in ground cover, surface runoff and erosion increased in many areas.

Regulation of grazing and other land uses in recent years has generally improved ecological condition and reduced soil erosion, although evidence of overgrazing still exists. Non-native, weedy annual plant species have become established; cheatgrass, Russian thistle, sunflowers, and various unpalatable mustards are common. There has been a gradual replacement of herbaceous species by woody species of lower forage value. Tamarisk or salt cedar (an introduced undesirable shrubby tree) has become the dominant streamside and floodplain species at lower elevations, following its introduction for erosion control along flood channels.

Since the passage of the Taylor Grazing Act in 1934, the BLM has, in cooperation with the local livestock permittees, attempted to restore or enhance the rangeland's productivity. Many areas of pinyon-juniper and sagebrush have been cleared and seeded; grazing systems have been established on some allotments; and rangeland developments (i.e., water developments and fences) have been installed to improve livestock distribution. Periods and/or patterns of use have been altered and livestock numbers reduced to improve plant vigor and vegetation composition. These actions have had various degrees of success as evidenced by current ecological condition and a comparison of current forage production with potential.

## Ecological Condition

Ecological condition, as used in this EIS, is based on the ecological concept which relates the current condition of the range to the potential of which it is naturally capable (Earth Environmental Consultants, Inc., 1980; Stoddart, Smith, and Box, 1975; Society of Range Management, 1974). This method of range condition classification separates each range site into four stages or condition classes: climax, late, mid, or early. Climax is synonymous with natural potential or a plant community that is the result of all natural environmental factors including fire and use by native animals.

An example of climax pinyon-juniper on an upland stoney, loam range site is "an open stand of Utah juniper and pinyon pine with grass and shrub understory and a grass and shrub mix in open areas". The composition by weight is 25 percent shrubs, 25 percent trees, 45 percent grasses, and 5 percent forbs." (Earth Environmental Consultants, Inc, 1980).

TABLE 3-2

Preliminary List of Threatened, Endangered, or Sensitive Plants and Their Known Habitats

Asclepias ruthiae Maguire

Emery County, 3 miles north of Hanksville (4,700 ft. elevation); Sandy Bench, Ephedra, Amsonia community (Harrison, 1947).

Wayne County, 14.6 miles east of Caineville on US-24; moderate SW slope, desert shrub zone, 10 percent cover Ephedra-sage-Hillaria (Woodruff, 1973).

Wayne County, T. 28 S., R. 9 E. Sec. 5, Summit of North Caineville Mesa, about 13.5 mi. due WNW of Hanksville (6,000 ft. elev.); Emery sandstone formation, mixed grass-shrub community, sandy silt (S, E and M Welsh, 1978).

Status: Category 1 (Federal Register [F.R.] Dec. 15, 1980).

Astragalus barnebyi Welsh and Atwood

Garfield County, Henry Mountain Kings Ranch (5,000 ft. elevation); gravelly bench (Cottam, 1953). Wayne County, Summit of North Caineville Mesa, T. 28 S., R. 9 E. Sec. 5.; Emery sandstone member of Mancos shale, Rimrock. About 13.5 mi. WNW of Hanksville at 6,000 ft. elevation (S. Welsh, K. Taylor, F. Peabody, 1976).

Status: Category 1 (F.R. Dec. 15, 1980).

Astragalus henrimontanensis Welsh

Garfield County; habitat; Quarternary Alluvium and Colluvium over various geologic strata, gravelly loam soil mixed ponderosa pine, pinyon, juniper and sagebrush community (elevation 7,400 to 9,200 feet.) Wayne County, Henry Mtns. T. 31 S., R. 10 E. Sec. 14. SW facing slope, spruce, ponderosa, aspen community (Neese, 1976).

Wayne County, Henry Mountains T. 31 S., R. 10 E. Sec. 31; ponderosa, pinyon pine, sagebrush community (Neese, 1976).

Status: Category 2 (F.R. Dec. 15, 1980)

Astragalus monumentalis Barneby

Garfield and San Juan Counties, Utah; Cedar Mesa sandstone formation, crevices in rimrock and other slickrock sites; pinyon, juniper and warm desert shrub communities (elevation 4,000-6,100 ft.).

Status: Category 1 (F.R. Dec. 15, 1980).

TABLE 3-2 (continued)

Astragalus harrisonii Barneby

Wayne County, natural bridge, Capitol Reef Monument; Navajo Blow Sand, canyon bottom, pinyon-juniper community. Welsh, SL-5217 (00055833) 1 May 1966 - Navajo sandstone formation, sandy rock ledges and talus slopes along the canyon.

Status: Category 1 (F.R. Dec. 15, 1980)

Dalea epica Welsh

Garfield County, Ticaboo Shelf Spring, 15 mi. SE of Mt. Hillers, Henry Mtns. (4,800 ft. elevation); Navajo sandstone, slickrock RHVS, Cowania, Yucca, Navajo sandstone, Bedrock and sandstone (Arnow, 1971).

Status: Category 2 (F.R. Dec. 15, 1980).

Eriogonum cronquistii Reveal

Garfield County; loose decomposed granite talus slopes on the west side of Bull Mountain, Henry Mountains at 8,300 ft. elevation (Holmgren and Reveal, 1967).

Status: Category 2 (F.R. Dec. 15, 1980).

Eriogonum ostlundii M. E. Jones

Garfield County, Henry Mountains (4,300 ft. elevation); sandy soil (Stanton, 1932). Habitat: clay hills and slopes, cool desert shrub and pinyon-juniper communities.

Wayne County, 2.5 mi. north of Highway 24 on Sand Creek Road, west of Torrey; sandy soil, pinyon-juniper community, (Atwood, 1978).

Status: Category 2 (F.R. Dec. 15, 1980).

Eriogonum smithii Reveal

Emery County, San Raphael Desert, east side of summit, 10 mi. SE on Desert road. .50 mi. so. of Goblin Valley (5,500 ft. elevation), red seleniferous sand, Astragalus and Ephedra community, (Holmgren and Reveal, 1966).

Status: Category 1 (F.R. Dec. 15, 1980).

Euphorbia nephradenia Barneby

Wayne County, about 3 miles east of Flat Top well on road to Maze, Utah Highway 24; stable dune sand, eriogonum, leptophyllum, Ephedra viridis (Welsh, Atwood, Moore, 1970).

Status: Category 3C (F.R. Dec. 15, 1980).

TABLE 3-2 (concluded)

Hymenopappus filifolius Hook var. tomentosus (Rydb.) Turner

Garfield County, 50 miles southwest of San Raphael (5,000 ft. elev.); dry sandy knolls (Harrison, 1934).

Wayne County, Henry Mountains 9 miles south Hanksville transect No. 3 (4,900 ft. elevation); Mancos shale, nearly bare slopes (Harrison, 1947).

Garfield County, Crescent Creek, Mt. Ellen, Henry Mountains (5,000 ft. elevation); streamside (Stanton, 1930).

Status: Category 3C (F.R. Dec. 15, 1980).

Phacelia indecora J. T. Howell

Wayne County, 19 miles west of Hanksville, (4,400 ft. elevation) milepost 85; clay soil and lava hill, open bare space, shadscale, Ephedra and blackbrush (Atwood, 1968).

Status: Category 1 (F.R. Dec. 15, 1980).

Pediocactus winkleri

Garfield County, one population east of Oyster Shell Reef in Henry Mountain Resource Area (HMRA), (Greenwood, 1978-80).

Status: Category 1 (F.R. Dec. 15, 1980).

Sclerocactus wrightiae L. Benson

Utah, Wayne County, Summit of North Caineville Mesa, T. 28 S., R. 9 E. Sec. 5; Emery sandstone member of Mancos shale, Rimrock (Welsh, Taylor, and Peabody, 1976).

Wayne County, T. 28 S., R. 9 E., Sec. 6, west base of North Caineville Mesa, about 14.5 miles WNW of Hanksville (5,200 ft. elevation); Bluegate Shale formation, Atriplex Community (S., E. and M. Welsh, 1978).

Status: Officially listed as endangered (F.R. June 16, 1976).

Source: USDI, BLM, 1982.

The following four ecological condition classes were used:

| Stages | Percent of Natural Potential |
|---|---|
| Climax | 76-100 |
| Late | 51-75 |
| Mid | 26-50 |
| Early | 0-25 |

Rangelands were classified as to ecological condition based on the soil-vegetation inventory. Of the 1,312,021 acres of BLM public lands inventoried, 66 percent were classified as to condition, showing 3 percent in climax, 18 percent in late, 63 percent in mid, and 16 percent in early stages (see Table 3-3 and Appendix 2). Thirty-four percent of the planning area was classified as barren.

The North and South Caineville Mesas are the only extensive areas showing major portions (in excess of 95 percent) in climax condition. There are five allotments (Waterpocket, Sandy 2, Sewing Machine, Cedar Point, and Robbers Roost) having in excess of 30 percent in late and climax stages. Conversely, there are five allotments (Flint Trail, North Bench, Cathedral, Trachyte, and Sawmill Basin) showing 30 or more percent in early stages.

Trend was based on study plots located in the key areas of each allotment. Of the 127 trend plots located in "key areas" of the planning area, 32 percent are improving, 48 percent are stable, and 20 percent are declining (see Table 3-3).

Plant species listed as key to livestock grazing (see Appendix 2) occupy a relatively high percentage of the ground cover of each trend study plot and generally furnish a major proportion of the forage consumed by livestock. Each grass species, in particular, may represent between 10 to 40 percent of the plant composition by weight for any given site. Trend studies within each of 19 allotments authorized for livestock grazing contain the following data: (1) years of records; (2) licensed use in percent of active preference for the 5 years prior to 1981; (3) key and other indicator species; (4) utilization studies summarized for years prior to 1975, 1975-1979, and for 1979-1981; (4) trend for key species (browse, seedlings, cool season grasses, warm season grasses); and (5) trend by photo record, index and best long-term estimate based on an overall evaluation of all study data (see Appendix 2).

## Seedings

A total of 6,878 acres, including 6,290 acres of public lands, have been seeded. Table 3-3 lists the acreage seeded by allotment. Most of the sites were prepared by chaining pinyon-juniper and seeding a mixture of cool-season grasses (crested wheatgrass and some intermediate wheatgrass) and alfalfa. Most of the seedings have held up fairly well under grazing and still retain a high composition of alfalfa as well as introduced grasses.

Dry weight production shortly after seeding ranged between 500 and 1,200 lbs. per acre. Current soil-vegetation inventory estimates of total dry weight production varied from 500 and 1,300 lbs., and estimates of grazing capacity for cattle varied from 2 and 8 acres per animal unit month (AUM). Representative seedings in the Pennell Allotment showed the production and plant composition given in Table 3-4.

TABLE 3-4

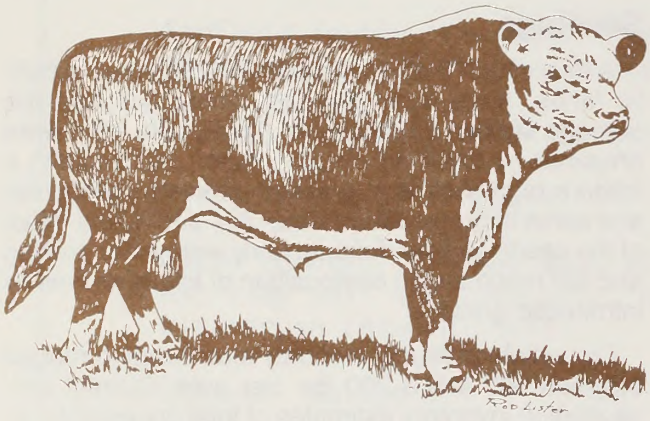
Pennell Allotment Seedings

| | Site 1 | | Site 2 | | Site 3 | |
|---|---|---|---|---|---|---|
| Species | lbs/ac. | Percent Composition | lbs/ac. | Percent Composition | lbs/ac. | Percent Composition |
| Crested Wheatgrass | 847 | 63 | 329 | 62 | 262 | 52 |
| Total Grass | 906 | 68 | 405 | 76 | 309 | 61 |
| Alfalfa | 215 | 16 | 88 | 17 | 0 | 0 |
| Total Forbs | 255 | 19 | 107 | 20 | 69 | 14 |
| Pinyon/Juniper | 2 | 1 | 1 | 1 | 63 | 13 |
| Total Shrubs | 179 | 13 | 21 | 4 | 125 | 25 |
| Total Vegetation | 1,340 | 100 | 533 | 100 | 503 | 100 |

Source: USDI, BLM, 1982.

## Poisonous Plants

Poisonous plants of major concern include several species of *Astragalus* (locoweed), *Oxytropis* (crazyweed), *Asclepias* (milkweed), and *Hymenoxys richardsonii* (Colorado rubber weed). Livestock losses caused by poisonous plants date back to the early history of grazing use in the area. Milkweed was especially troublesome along the livestock trails when many sheep herds grazed the area. Locoweed was and is still a problem, especially on early spring range. Selinium-bearing plants such as *Stanleya pinnata* (prince's plume) and locoweeds have been responsible for major sheep losses.



## Range Potential

Current production of climax vegetation expressed as a percent of the natural potential on native rangelands is estimated to range from a low of 43 percent for the Cathedral Allotment to a high of 100 percent on North Caineville Mesa, an area presently unallotted to grazing (Table 3-3). The high for an allotment currently under livestock grazing is 61 percent on Sewing Machine.

Documentation is insubstantive on the effectiveness of using grazing management to increase grazing capacity on native, desert, and, in particular, semi-desert rangelands. Studies with cattle at several Western research stations do not show significant increases in grazing capacities (in AUMs) within 5- to 20-year time frames as a result of using only improved management. Most grazing studies compare continuous season-long grazing with deferred-rotation grazing. Cattle gains, ground cover, plant composition, and dry weight production of vegetation were used as indexes to change (Fisher and Marion, 1951; Hubbard, 1951; Hutchings and Stewart, 1953; Hyder and Sawyer, 1951; McIlvain and Savage, 1951; Rogler, 1951; Sampson, 1951; Stoddart, Smith, and Box, 1975).

Moderate, continuous season-long grazing generally favors the maintenance of a productive rangeland and livestock production. However, study and documentation of community dynamics sites have been achieved at only a broad level, and only a broad estimate of potential forage production is attainable by grazing management alone. In general, moderate season-long grazing favors the maintenance of a productive rangeland.

The potential of a site to respond to land treatment is easier to evaluate. There have been a number of land treatments on a variety of rangeland sites in the planning area over the past 27 years. Therefore, grazing management and climate variables are known, and vegetation responses may be confidently based on past results.

## Grazing Capacity

Table 3-3 compares estimates of grazing capacities based on rangeland inventories with estimates from animal use records and studies. Although the actual use records and utilization studies are incomplete, it should be noted that, of the 19 allotments having sufficient study records on which to make comparisons, 10 support the inventory records while two do not. Records of use and/or utilization studies are insufficient to make comparisons on ten allotments. Five allotments are unallotted to grazing.

# SOILS

A soils survey was completed in May 1980 (Earth Environmental Consultants, Inc., 1980). This survey describes soil texture, depth, slope, permeability, salinity, etc., for each soil series and phase.

Soils vary from desert sand on mesas to clay loams on mountain slopes. A general soils map with a brief description of the 14 soil associations is shown in Figure 3-1.

Erosion condition was determined by measuring soil surface factors (SSFs) during the soil-vegetation inventory. (See Table 3-5 for the percentage and acreage of areas in the five erosion condition classes.) Most of the critical and severe areas are caused by geologic erosion and not much improvement can be expected.

The most severe man-caused erosion is related to road construction and overgrazing. These areas occur along Bull Creek in the Hanksville and Sawmill Basin Allotments, the Meadow Gulch headcut in the Hanksville Allotment, and on steep slopes of the Nasty Flat Allotment.

TABLE 3-3

Ecological Condition, Trend, Grazing Use, Production Potential, Acreage Seeded, and Forage Utilization With Comparisons of Grazing Capacity Estimates[a]

| ALLOTMENTS | Land Status | Acres | Rangeland (Percent) | Current Ecological Successional Stage of Rangeland (%) Climax | Late | Mid | Early | Trend in Range Condition No. Plots | Imp (%) | Stable (%) | Decl. (%) | Active Preference (AUMs) | Average Licensed Use (AUMs) | Current Big Game Use (AUMs) Bison | Deer | Antelope | Bighorn Sheep | Adjudicated Livestock Period of Use | Actual Period Used | Average Utilization Key Species Prior to 1976 | Average Utilization Key Species Since 1976 | AUMs Based on Inventory Cattle | Sheep | Bison | Percent Change From Preference | Percent Change From Licensed Use | Forage Use (AUMs) Based on Studies Livestock | Bison | Percent Change From Preference | Percent Change From Licensed Use | Current Production % of Natural Potential on Native Rangeland | Acres of Reseeded Rangeland | Studies Support Inventory |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue Bench | BLM | 87,926 | 61 | 0 | 10 | 82 | 8 | 8 | 25 | 63 | 12 | 4,598 C | 1,963 C | 5 (8)[b] | 34 | 0 | 0 | 9/1-5/31 C | Same | 61 | 40 | 2,753 | -- | 4 (8) | 40↓ | 40↑ | 2,357 | 8 | 49↓ | 20↑ | 51 | 0 | Yes. |
| | S | 13,477 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 1,221 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 102,624 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bullfrog | BLM | 82,546 | 51 | 2 | 19 | 61 | 18 | 7 | 43 | 29 | 28 | 3,120 C 322 S | 1,459 C 80[c] S | 74 (97) | 62 | 0 | 0 | 10/1-5/31 C&S | 11/1-5/31 | 45 | 38 | 2,356 | 679 | 45 | 12↓ | 97↑ | -- | -- | -- | -- | 52 | 0 | -- |
| | S | 9,423 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 855 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 92,824 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Burr Point | BLM | 66,250 | 75 | 0 | 7 | 85 | 8 | 7 | 29 | 71 | 0 | 2,138 C 2,279 S | 1,337 C 0 S | 15 | 32 (35) | 11 | 0 | 9/1-5/31 C 10/1-5/5 S | 10/16-5/31 11/6-5/31 | 42 | 26 | 1,091 | 1,174 | 15 | 49↓ | 69↑ | 2,481 | 15 | 44↓ | 86↑ | 50 | 331 | Yes. |
| | S | 7,862 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 599 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 74,711 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cathedral | BLM | 104,645 | 48 | 0 | 4 | 64 | 32 | 8 | 13 | 62 | 25 | 2,503 C | 1,035 C | 0 | 121 | 0 | 0 | 10/1-5/31 C | Same | NO | NO | 1,871 | -- | -- | 25↓ | 81↑ | -- | -- | -- | -- | 43 | 0 | -- |
| | S | 12,818 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 1,530 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 11,688 | | | | | | | | | | 495 C | 212 C | | | | | | | | | | | | | | | | | | | | |
| | T | 130,681 | | | | | | | | | | 2,998 C | 1,247 | | | | | | | | | | | | | | | | | | | | |
| Cedar Point | BLM | 52,152 | 75 | 4 | 28 | 61 | 7 | 4 | 50 | 50 | 0 | 1,892 C | 819 C | 8 (15) | 52 | 19 | 0 | 9/1-5/31 | Same | NO | NO | 1,273 | -- | 6 (9) | 33↓ | 55↑ | -- | -- | -- | -- | 57 | 397 | Yes. |
| | S | 5,862 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 58,022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Crescent Creek | BLM | 8,488 | 68 | 0 | 11 | 74 | 15 | 4 | 25 | 50 | 25 | 332 C | 335 C | 65 | 81 | 0 | 0 | 6/1-9/15 | Same | 61 | 49 | 187 | -- | 55 | 44↓ | 44↓ | 312 | 55 | 6↓ | 6↓ | 49 | 877 | Yes. In direction of trend. |
| | S | 1,114 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 101 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 9,703 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ory Lakes (unallotted) | BLM | 9,527 | 78 | 0 | 12 | 88 | <1 | 0 | -- | -- | -- | n/a | n/a | 100 (226) | 59 | 0 | 0 | -- | -- | NO | NO | 0 | -- | 88 (190) | -- | -- | -- | -- | -- | -- | 53 | 0 | No livestock grazing. |
| | S | 1,235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 10,769 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flint Trail (unallotted) | BLM | 31,552 | 43 | 5 | 17 | 47 | 31 | 0 | -- | -- | -- | n/a | n/a | 0 | 166 | 0 | 0 | -- | -- | NO | NO | -- | -- | -- | -- | -- | -- | -- | -- | -- | 49 | 0 | No livestock grazing. |
| | S | 12,037 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 71,800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 115,389 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hanksville | BLM | 79,759 | 87 | <1 | 11 | 66 | 23 | 6 | 50 | 33 | 17 | 4,538 C 1,462 S | 2,499 C 0 S | 18 | 44 | 19 | 0 | 9/1-5/31 C 10/1-5/5 S | 10/1-5/31 12/16-3/31 | NO | NO | 6,159 | 4,056 | 18 | 70↑ | 308↑ | -- | -- | -- | -- | 47 | 0 | A distribution problem. |
| | S | 9,136 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 1,759 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 90,654 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hartnet | BLM | 23,396 | 59 | 0 | 15 | 84 | 1 | 9 | 0 | 89 | 11 | 1,021 C | 603 C | 0 | 103 | 0 | 0 | 11/1-5/31 C | Same | 64 | 31 | 967 | -- | -- | 5↓ | 60↑ | 934 | -- | 9↓ | 55↑ | 54 | 0 | Yes. |
| | S | 2,766 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 102 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 67,440 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 93,704 | | | | | | | | | | 1,917 C | 1,121 C | | | | | | | | | | | | | | | | | | | | |
| Little Rockies (unallotted) | BLM | 29,475 | 56 | 10 | 10 | 79 | 1 | 0 | -- | -- | -- | 2,938 n/a | 1,724 n/a | 0 | 16 | 0 | 0 | -- | -- | NO | NO | -- | -- | -- | -- | -- | -- | -- | -- | -- | 57 | 0 | No livestock grazing. |
| | S | 2,801 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 35,414 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 67,690 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nasty Flat | BLM | 13,851 | 76 | 0 | 16 | 77 | 7 | 6 | 17 | 33 | 50 | 474 C | 436 C | 685 | 71 (73) | 0 | 0 | 6/1-9/30 | Same | 53 | 56 | 399 | -- | 576 | 16↓ | 8↓ | 385 | 576 | 19↓ | 12↓ | 52 | 1,081 60 | Yes. |
| | S | 2,230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 1,260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 17,341 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| North Bench | BLM | 22,776 | 37 | 0 | 25 | 41 | 34 | 3 | 67 | 33 | 0 | 456 C | 46 C | 0 | 39 | 0 | 0 | 9/1-11/30 | Same | 42 | NO | 306 | -- | -- | 33↓ | 565↑ | -- | -- | -- | -- | 48 | 0 | Yes. |
| | S | 2,685 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 25,461 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. Caineville Mesa (unallotted) | BLM | 1,989 | 43 | 100 | 0 | 0 | 0 | 0 | -- | -- | -- | n/a | n/a | 0 | 8 | 0 | 0 | -- | -- | NO | NO | -- | -- | -- | -- | -- | -- | -- | -- | -- | 100 | 0 | No livestock grazing. |
| | S | 96 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 2,085 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pennell | BLM | 56,367 | 69 | 0 | 19 | 80 | 1 | 13 | 46 | 46 | 8 | 2,420 C 174 S | 1,391 C 0 S | 952 (958) | 205 | 0 | 0 | 6/1-10/31 C 6/1-10/31 S | Same 6/1-10/10 | 59 | 46 | 2,330 | 231 | 829 (835) | 1↓ | 84↑ | 1,558 | 835 | 40↓ | 12↑ | 55 | 2,780 | Yes. In direction of trend. |
| | S | 6,887 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 63,254 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Robbers Roost | BLM | 159,420 | 63 | 5 | 27 | 44 | 24 | 8 | 50 | 50 | 0 | 5,288 C | 2,800 C[d] | 0 | 392 | 31 | 22 | 3/1-2/28 | Same | NO | NO | 6,439 | -- | -- | 22↑ | 129↑ | -- | -- | -- | -- | 53 | 0 | A distribution problem. |
| | S | 23,004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 23,345 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 205,929 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE 3-3 (concluded)

| ALLOTMENTS | Land Status | Acres | Rangeland (Percent) | Current Ecological Successional Stage of Rangeland: Climax | Late | Mid | Early | Trend in Range Condition: No. Plots | Imp (%) | Stable (%) | Decl. (%) | Active Preference (AUMs) | Average Licensed Use (AUMs) | Current Big Game Use (AUMs): Bison | Deer | Antelope | Bighorn Sheep | Adjudicated Livestock Period of Use | Actual Period Used | Average Utilization Key Species Prior to 1976 | Average Utilization Key Species Since 1976 | AUMs Based on Inventory: Cattle | Sheep | Bison | Percent Change From Preference | Percent Change From Licensed Use | Forage Use (AUMs) Based on Studies: Livestock | Bison | Percent Change From Preference | Percent Change From Licensed Use | Current Production % of Natural Potential on Native Rangeland | Acres of Reseeded Rangeland | Studies Support Inventory |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rockies | BLM | 116,391 | 75 | 3 | 11 | 64 | 22 | 9 | 12 | 73 | 15 | 5,600 C | 3,554 C | 0 | 69 | 0 | 16 | 10/1-5/31 C | 10/16-5/31 | 56 | NO | 3,988 | 875 | 0 | 17↓ | 36↑ | -- | -- | -- | -- | 49 | 0 | -- |
| | S | 16,811 | | | | | | | | | | 272 S | 34[c] S | | (75) | | | 10/1-5/31 S | 1/16-2/23 | | | | | | | | | | | | | | |
| | P | 263 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 35,573 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 169,038 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sandy 1 | BLM | 24,663 | 71 | 0 | 22 | 73 | 5 | 4 | 25 | 75 | 0 | 927 C | 728 C | 0 | 33 | 0 | 0 | 10/1-4/15 C | Same | 58 | NO | 656 | 210 | 0 | 10↓ | 20↑ | -- | -- | -- | -- | 54 | 0 | Yes. |
| | S | 3,853 | | | | | | | | | | 51 S | 0 S | | | | | 12/1-2/15 S | Same | | | | | | | | | | | | | | |
| | P | 1,631 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 13,436 | | | | | | | | | | 282 C | 217 C | | | | | | | | | | | | | | | | | | | | |
| | T | 43,583 | | | | | | | | | | 1,260 | 945 | | | | | | | | | | | | | | | | | | | | |
| Sandy 2 | BLM | 45,602 | 76 | <1 | 38 | 50 | 12 | 8 | 50 | 38 | 12 | 2,228 C | 1,509 C | 122 | 29 | 0 | 0 | 10/16-4/15 C | Same | 65 | 43 | 707 | -- | 122 | 68↓ | 53↓ | -- | -- | -- | -- | 57 | 196 | No. Studies support a higher grazing capacity estimate. |
| | S | 5,882 | | | | | | | | | | | | (155) | | | | | | | | | | (155) | | | | | | | | |
| | P | 2,294 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 8,140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 61,918 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sandy 3 | BLM | 4,494 | 85 | 0 | 25 | 75 | <1 | 4 | 25 | 50 | 25 | 305 C | 184 C | 0 | 12 | 0 | 0 | 10/16-4/15 C | Same | 59 | NO | 301 | -- | -- | 1↓ | 64↑ | -- | -- | -- | -- | 56 | 0 | -- |
| | S | 1,590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 18,556 | | | | | | | | | | 680 C | 408 C | | | | | | | | | | | | | | | | | | | | |
| | T | 24,670 | | | | | | | | | | 985 | 592 | | | | | | | | | | | | | | | | | | | | |
| Sawmill Basin | BLM | 9,247 | 60 | 0 | 5 | 64 | 31 | 3 | 0 | 67 | 33 | 166 C | 33 C | 146 | 95 | 0 | 0 | 7/16-8/31 C | Same | 52 | 29 | 96 | 0 | 114 | 42↓ | 191↑ | 195 | 114 | 17↑ | 490↑ | 44 | 397 | No. Studies support a higher grazing capacity estimate. |
| | S | 557 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 9,804 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sewing Machine | BLM | 56,939 | 63 | 12 | 25 | 57 | 6 | 0 | -- | -- | -- | 1,600 C | 950 C | 0 | 167 | 0 | 21 | 11/1-4/15 C | Same | NO | NO | 2,646 | 0 | 0 | 65↑ | 179↑ | -- | -- | -- | -- | 61 | 0 | A distribution problem. |
| | S | 6,983 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NRA | 65,394 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 129,316 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| So. Caineville Mesa (unallotted) | BLM | 3,805 | 63 | 96 | 0 | 4 | 0 | 0 | -- | -- | -- | n/a | n/a | 0 | 12 | 0 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 98 | 0 | No livestock grazing. |
| | S | 118 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 3,923 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Steele Butte | BLM | 74,132 | 73 | 3 | 24 | 66 | 7 | 12 | 25 | 50 | 25 | 5,034 C | 2,066 C | 202 | 112 | 0 | 0 | 10/16-5/31 C | Same | 56 | 19 | 1,874 | 0 | 202 | 63↓ | 9↓ | -- | -- | -- | -- | 56 | 628 | Yes. |
| | S | 7,173 | | | | | | | | | | | | (287 | | | | | | | | | | (296) | | | | | | | | |
| | P | 2,138 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 83,443 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trachyte | BLM | 51,597 | 78 | 6 | 10 | 49 | 35 | 0 | -- | -- | -- | 2,110 C | 1,120 C | 20 | 59 | 0 | 16 | 9/1-5/31 C | 11/1-5/31 | NO | NO | 1,164 | 800 | 14 | 31↓ | 63↑ | -- | -- | -- | -- | 47 | 0 | -- |
| | S | 5,399 | | | | | | | | | | 743 S | 84 S | | | | | 10/1-5/5 S | 1/16-4/30 | | | | | | | | | | | | | | |
| | P | 2,401 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 59,397 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Waterpocket | BLM | 36,531 | 73 | 13 | 28 | 41 | 18 | 4 | 0 | 50 | 50 | 2,861 C | 1,415 C | 0 | 31 | 0 | 0 | 10/1-5/31 C | 11/1-5/31 | 50 | NO | 2,952 | 456 | 0 | 8↑ | 125↑ | -- | -- | -- | -- | 59 | 0 | Recent trend studies not taken. |
| | S | 3,577 | | | | | | | | | | 304 S | 103[a] S | | | | | 10/1-5/31 S | 10/16-11/30 | | | | | | | | | | | | | | |
| | NP | 7,495 | | | | | | | | | | 164 C | 74 C | | | | | | | | | | | | | | | | | | | | |
| | NRA | 33,576 | | | | | | | | | | 18 S | 5[c] S | | | | | | | | | | | | | | | | | | | | |
| | T | 81,179 | | | | | | | | | | 3,347 | 1,597 | | | | | | | | | | | | | | | | | | | | |
| Wild Horse | BLM | 58,501 | 51 | 0 | 20 | 69 | 11 | 0 | -- | -- | -- | 1,067 C | 40 C | 0 | 128 | 0 | 0 | 12/1-6/30 C | Same | NO | NO | 1,491 | 0 | 0 | 40↑ | 3,600↑ | -- | -- | -- | -- | 52 | 0 | -- |
| | S | 7,619 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 66,160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | BLM | 1,312,021 | | | | | | 127 | 29 | 53 | 18 | 56,285 | 26,631 | | | | | | | | | | | | | | | | | | | | |
| | S | 172,995 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | 15,536 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NP | 126,755 | | | | | | | | | | 3,556 | 2,037 | | | | | | | | | | | | | | | | | | | | |
| | NRA | 265,965 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | T | 1,893,272 | | | | | | | | | | 59,841 | 28,668 | | | | | | | | | | | | | | | | | | | | |

Source: Robinson et al., 1982. (See also Appendix Z.)

[a] Based on inventories and studies.

[b] Values shown in ( ) are estimates of AUMs needed by big game animals from BLM administered lands (as per BLM/UDWR distribution agreement); however, forage is not available to meet all these needs.

[c] Intermittent use.

[d] Plus 100 burros.


## GENERAL SOILS MAP
### HENRY MOUNTAINS AREA PARTS OF GARFIELD, KANE, AND WAYNE COUNTIES, UTAH.

DOMINATELY VERY DEEP TO SHALLOW, WELL DRAINED AND SOMEWHAT EXCESSIVELY DRAINED, GENTLY SLOPING TO VERY STEEP SOILS ON BENCHES, TERRACES, ALLUVIAL FANS, HILLSIDES, VALLEYS, MESAS, PEDIMENTS AND DISSECTED UPLANDS, IN ARID CLIMATE ZONE.

1. Mottat-Sheppard-Blackston

Very deep, well drained and somewhat excessively drained, gently sloping to steep soils on benches, alluvial fans, terraces, hillsides and valleys.

2. Robroost-Gobin-Shepherd

Very shallow to very deep well drained to somewhat excessively drained, gently sloping to moderately steep soils on alluvial fans, benches, hillsides, pediment surfaces and valleys.

3. Chipeta-Hanksville-Leebench

Shallow to very deep, well drained, dominantly nearly level to steep but rengee to very steep soils on mesas, benches, hillsides, alluvial fans, and fan terraces.

DOMINATELY SHALLOW OR VERY SHALLOW, WELL DRAINED AND EXCESSIVELY DRAINED, GENTLY SLOPING TO VERY STEEP SOILS AND ROCK OUTCROP ON MESAS, BENCHES, HILLSIDES AND PEDIMENT SURFACES IN ARID AND SEMIARID CLIMATE ZONES.

4. Farb-Moenkopie-Pennell

Very shallow or shallow, well drained and excessively drained, gently sloping to very steep soils on mesas and hillsides.

5. Badland-Chicele-Farb

Badland, and shallow and very shallow, excessively drained and well drained, gently sloping to very steep soils on mesas, benches and hillsides.

6. Rock outcrop-Arches-Moenkopie

Rock outcrop, and very shallow and shallow, well drained, gently sloping to steep soils on benches, mesas, pediment surfaces and hillsides.

7. Rock outcrop

This map is in the east part of the soil survey area. This unit makes up about 8 percent of the survey area. It is about 90 percent Rock outcrop. The remaining 10 percent is components of minor extent.

8. Mivida-Mido-Wayneco

Very deep and shallow, well drained and excessively drained, nearly level to steep soils on mesas, benches, ridges, fan terraces, valleys, and hillsides.

9. Mellenthin-Mido-Begay

Shallow and very deep, well drained and excessively drained, gently sloping to steep soils on mesas, benches, alluvial fans, hillsides and valleys.

10. Travessilla-Yarts-Shedado

Very shallow to very deep, well drained nearly level to very steep soils on mesas, benches, hillsides, and valleys.

11. Rizozo-Chipeta-Begay

Very shallow, shallow and very deep, well drained gently sloping to steep soils on masss, benches, ridges, alluvial fans, valleys and hillsides.

DOMINATELY SHALLOW TO VERY DEEP, WELL DRAINED, SLOPING TO VERY STEEP SOILS ON FANS, FAN TERRACES, BENCHES AND MOUNTAINSIDES IN DRY SUBHUMID CLIMATE ZONE.

12. Circleville-Blazon-Montosa family

Shallow to very deep, well drained, sloping to very steep soils on fans, fan terraces, benches and mountainsides.

DOMINATELY VERY DEEP TO SHALLOW, WELL DRAINED, MODERATELY STEEP TO VERY STEEP SOILS ON MOUNTAIN SIDES IN MOIST SUBHUMID AND HUMID CLIMATE ZONES.

13. Delson-Datino family-Makoti family

Very deep to moderately deep, well drained, moderately steep to very steep soils on mountain slopes.

14. Pando family-Rogert-Olnes family

Deep and shallow, well drained, very steep soils on mountain sides.

15. Unsurveyed areas

The western part of the soil survey area is part of the Capitol Reef National Park. This area though included in the soil survey area was not mapped. This unit makes up about 10 percent of the survey area.

FIGURE 3-1

SOILS

TABLE 3-5

Present Erosion Condition

| Allotments | Acres and Percent | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stable | | Slight | | Moderate | | Critical | | Severe | | Unclassified[a] Barren or Rock | |
| | Acres | % | Acres | % | Acres | % | Acres | % | Acres | % | Acres | % |
| Blue Bench | 1,703 | 2 | 40,934 | 40 | 42,322 | 41 | 610 | 1 | 8,474 | 8 | 8,581 | 8 |
| Bullfrog | -- | -- | 25,341 | 27 | 63,751 | 69 | 2,033 | 2 | -- | -- | 1,699 | 2 |
| Burr Point | 1,326 | 2 | 15,422 | 21 | 38,242 | 51 | 16,069 | 22 | -- | -- | 3,652 | 4 |
| Cathedral | 1,471 | 1 | 14,539 | 11 | 72,746 | 56 | 30,162 | 23 | -- | -- | 11,763 | 9 |
| Cedar Point | 681 | 1 | 41,445 | 71 | 7,113 | 12 | 5,011 | 9 | -- | -- | 3,772 | 7 |
| Crescent Creek | 1,890 | 19 | 3,647 | 38 | 2,254 | 23 | 784 | 8 | -- | -- | 1,128 | 12 |
| Dry Lakes | 428 | 4 | 8,030 | 74 | 1,039 | 10 | -- | -- | -- | -- | 1,272 | 12 |
| Flint Trail | 290 | 1 | 40,818 | 35 | 48,726 | 42 | -- | -- | -- | -- | 25,555 | 22 |
| Hanksville | 1,572 | 1 | 20,410 | 23 | 53,069 | 59 | 9,049 | 10 | 2,850 | 3 | 3,704 | 4 |
| Hartnet | -- | -- | 9,666 | 10 | 15,431 | 16 | 431 | 1 | -- | -- | 68,176 | 73 |
| Little Rockies | 6,123 | 9 | 55,700 | 82 | 3,194 | 5 | -- | -- | -- | -- | 2,673 | 4 |
| Nasty Flat | 74 | 1 | 7,499 | 43 | 7,576 | 44 | 1,217 | 7 | -- | -- | 975 | 5 |
| North Bench | -- | -- | 1,926 | 8 | 20,913 | 82 | -- | -- | -- | -- | 2,622 | 10 |
| Pennell | 6,325 | 10 | 37,320 | 59 | 13,283 | 21 | 1,898 | 3 | -- | -- | 4,428 | 7 |
| Robbers Roost | 2,448 | 1 | 48,280 | 23 | 87,063 | 42 | 67,359 | 33 | -- | -- | 779 | 1 |
| Rockies | 2,242 | 2 | 60,881 | 36 | 62,550 | 37 | 24,568 | 15 | 1,316 | 1 | 17,481 | 10 |
| Sandy 1 | -- | -- | 4,787 | 11 | 7,753 | 18 | 17,425 | 40 | -- | -- | 13,618 | 31 |
| Sandy 2 | -- | -- | 8,669 | 14 | 24,767 | 40 | 27,244 | 44 | -- | -- | 1,238 | 2 |
| Sandy 3 | -- | -- | 913 | 4 | 4,487 | 18 | 367 | 1 | -- | -- | 18,903 | 77 |
| Sawmill Basin | 392 | 4 | 5,589 | 57 | 3,235 | 33 | -- | -- | -- | -- | 588 | 6 |
| Sewing Machine | -- | -- | 38,841 | 30 | 38,862 | 30 | 25,543 | 20 | -- | -- | 26,070 | 20 |
| Steele Butte | 1,536 | 2 | 13,589 | 16 | 43,957 | 53 | 9,026 | 11 | -- | -- | 15,335 | 18 |
| Trachyte | 5,642 | 10 | 21,895 | 37 | 25,384 | 43 | 4,935 | 8 | -- | -- | 1,541 | 2 |
| Waterpocket | 816 | 1 | 28,842 | 35 | 40,436 | 50 | 457 | 1 | -- | -- | 10,628 | 13 |
| Wild Horse | -- | -- | 19,983 | 30 | 24,980 | 38 | 10,025 | 15 | -- | -- | 11,172 | 17 |
| Total[b] | 34,959 | 2 | 574,966 | 30 | 753,133 | 40 | 254,213 | 13 | 12,640 | 1 | 257,353 | 14 |

Source: USDI, BLM, 1982.

[a]Unclassified includes lands in Capitol Reef National Park.

[b]Does not include North and South Caineville Mesas (6,008 acres).

# WATER RESOURCES

The planning area is located in the Upper Colorado River Sub-basin of the Colorado Hydrologic Region and contains 113 streams (many are intermittent). The planning area is divided into four drainage subareas: the Lower Fremont River, the Lower Muddy River, the Dirty Devil River, and direct drainage into the Colorado River.

## Water Quantity

The 113 streams referenced above generally originate on and flow through public lands. Snowmelt in spring and early summer provides most of the runoff for perennial streams with subsurface flow being the major contributor during the rest of the year. A large number of streams are intermittent and flow only for brief periods during snowmelt and high intensity thunderstorms. Estimation of water yield is difficult because a high proportion of runoff results from cloudburst floods and because most areas produce little or no runoff. Average annual water yield is estimated to be 0.14 inch per acre with the range estimated to be from 0.01 to 0.38 inch per acre from public land. There are numerous (over 110) small storage reservoirs on intermittent streams. Many are in need of repair and are located where other surface or groundwater sources are unavailable.

## Water Quality

Water quality is generally good in the upper portions of the streams and decreases downstream as salts accumulate, ground cover diminishes, water temperatures increase, fecal coliform count from livestock and wildlife increases, and sediment accumulates from runoff of snowmelt (USDI, BLM, 1982). The sediment yields of the Dirty Devil River and Muddy Creek are high, as their names imply. Most of the sediment discharge by streams in arid and semi-arid regions is transported during short periods, usually as a result of thunderstorms. In general, water quality, relative to its sediment content, is best during periods of low flow; water quality, relative to its chemical content, is best during periods of high flow (Mundorf as cited in Uintex Corporation, 1981). Water quality data was collected at 71 sites by BLM personnel from 1976-80. Additional samples from 106 sites on streams and springs have been provided to BLM under contract with Uintex Corporation. This data covers much of the western portion of the planning area and shows a coliform count ranging from 0-360,000/100 milliliters (ml) and total dissolved solids (TDS) from 115-4,700 milligrams per liter (mg/l). Most streams meet water quality standards for livestock and wildlife.

## Water Use

The primary water use is by livestock and wildlife. Other water uses include mining, irrigation, domestic, and, at times, power generation (USDI, BLM, 1982).

# ANIMAL LIFE

## Mule Deer

Deer herd unit 52 (Henry Mountains) and portions of herd units 45 (Last Chance), 46 (Thousand Lake Mountain), 29 (San Rafael), and 51A (Boulder) are located in the planning area (Figure 3-2). The only crucial deer range is located within the boundary of herd unit 52. Crucial mule deer summer and winter ranges are shown in Figure 3-2.

There are approximately 70,715 acres of crucial summer deer range. Distribution of these acres is shown by allotment in Table 3-6. Based on inventory data, approximately 10,762 acres (15 percent) of this range are in good habitat condition while 54,211 (77 percent) and 5,574 (8 percent) acres are in fair and poor condition, respectively (see Table 3-3). Only about 168 acres are considered in excellent condition.

There are approximately 41,472 acres of crucial winter deer range. Distribution of these acres is shown by allotment in Table 3-6. Based on inventory data, approximately 8,354 acres (20 percent) are in good habitat condition, while 28,265 (69 percent) and 3,903 acres (9 percent) are in fair and poor condition, respectively. Only 950 acres are considered in excellent condition.

Estimates of deer numbers and required AUMs on crucial summer and winter ranges are shown by allotment in Table 3-7. These estimates are based on actual inventory data as well as long-term population numbers determined from pellet group transects, browse utilization and trend studies, and hunter harvest information (Utah Division of Wildlife Resources [UDWR], 1981a and 1981c).

## Bison

Crucial bison range and herd unit boundaries are shown in Figure 3-3. There are approximately 83,222 and 32,703 acres of crucial bison summer and winter ranges, respectively. In addition, there are approximately 23,245 acres of crucial yearlong bison range. The distribution of crucial bison range is shown by allotment in Table 3-8. In general, this range is in fair habitat condition.

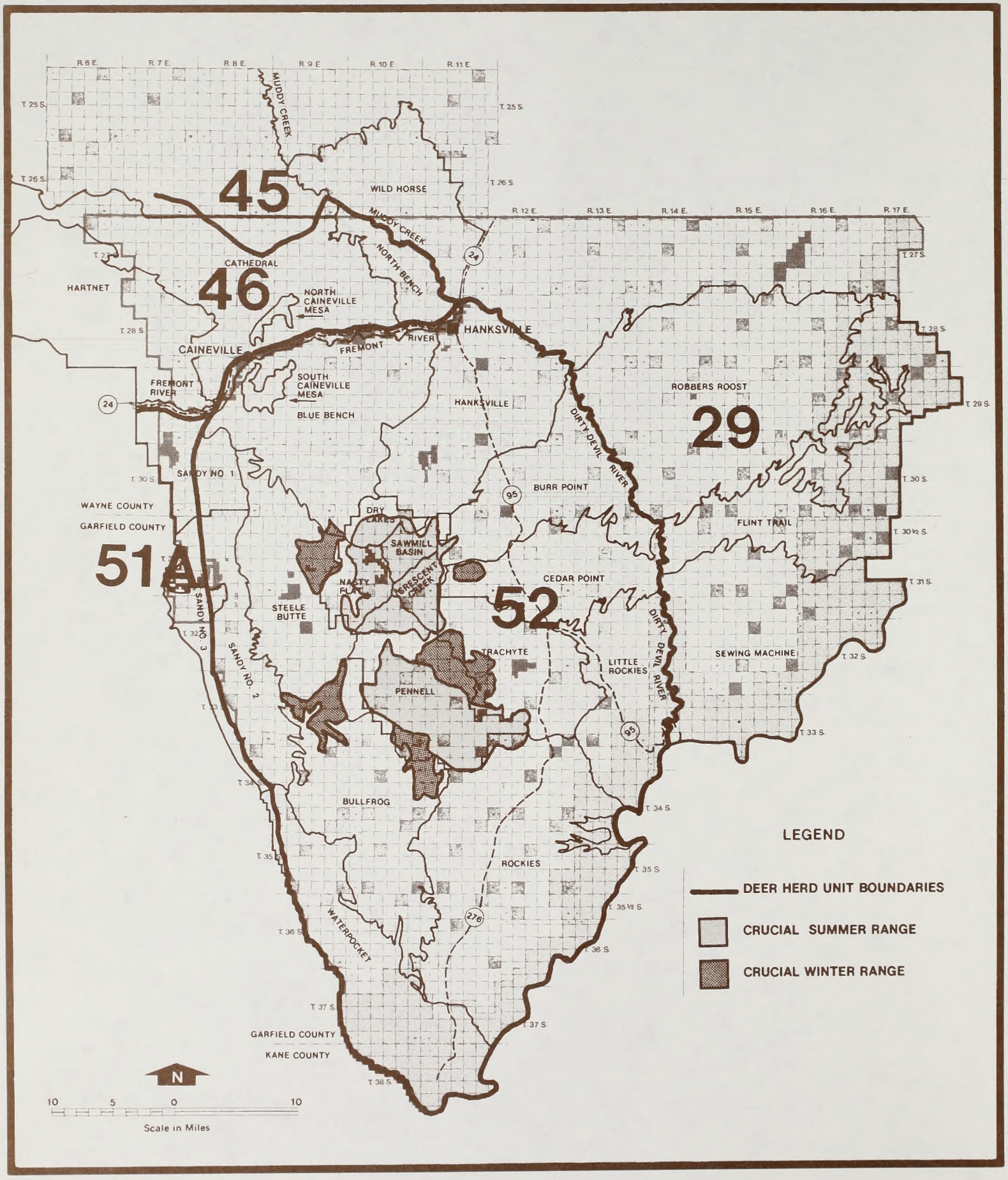



FIGURE 3-2

## DEER HERD UNIT BOUNDARIES AND CRUCIAL RANGES

TABLE 3-6

Crucial Deer Range

| Allotment | Summer Acreage | Winter Acreage |
|---|---|---|
| Blue Bench | 0 | 448 |
| Bullfrog | 0 | 3,175 |
| Burr Point | 608 | 0 |
| Cedar Point | 0 | 3,520 |
| Cresent Creek | 8,403 | 0 |
| Dry Lakes | 4,915 | 0 |
| Hanksville | 253 | 0 |
| Nasty Flat | 8,082 | 403 |
| Pennell | 37,369 | 14,522 |
| Rockies | 2,560 | 0 |
| Sawmill Basin | 7,008 | 0 |
| Steele Butte | 0 | 13,977 |
| Trachyte | 1,517 | 5,427 |
| Total | 70,715 | 41,472 |

Source: USDI, BLM, 1981.

TABLE 3-7

Estimated Current Deer Numbers and Forage Requirements

| | Crucial Deer Winter Range | | Crucial Deer Summer Range | |
|---|---|---|---|---|
| Allotment | Number of Animals | AUMs[a] | Number of Animals | AUMs[a] |
| Blue Bench | 2 | 2 | -- | -- |
| Bullfrog | 19 | 20 | -- | -- |
| Burr Point | 3 | 3 | 4 | 4 |
| Cedar Point | 29 | 30 | -- | -- |
| Crescent Creek | -- | -- | 91 | 94 |
| Dry Lakes | -- | -- | 55 | 57 |
| Hanksville | -- | -- | 10 | 10 |
| Nasty Flat | 9 | 9 | 91 | 94 |
| Pennell | 89 | 92 | 84 | 87 |
| Rockies | -- | -- | 20 | 21 |
| Sawmill Basin | -- | -- | 92 | 95 |
| Steele Butte | 62 | 64 | -- | -- |
| Trachyte | 33 | 34 | 24 | 25 |
| Total | 246 | 254 | 471 | 487 |

Source: UDWR, 1981.

[a]Conversion factor: 5.8 deer/AUM (AUMs shown are calculated based on number of animals shown).

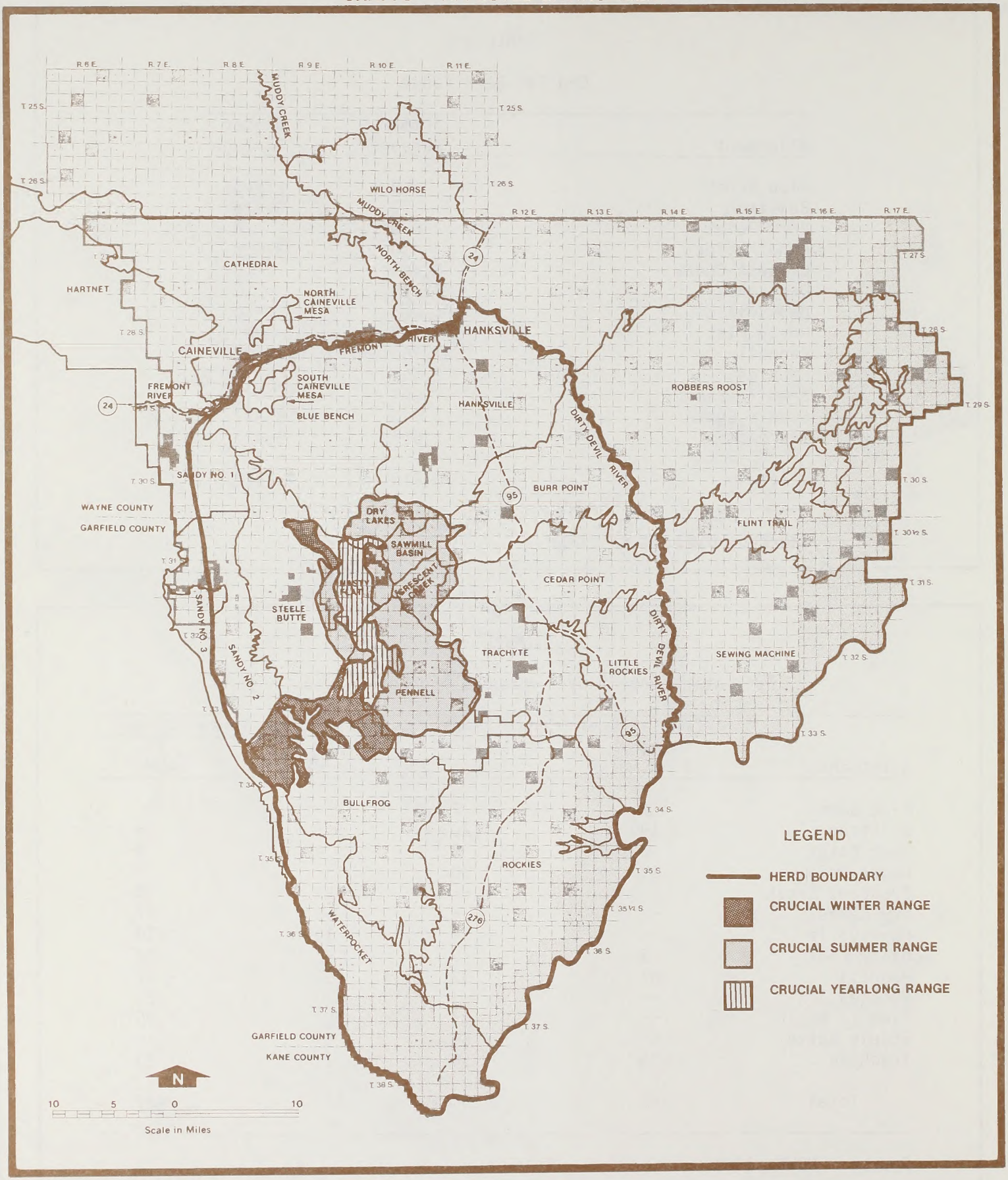



FIGURE 3-3

## BISON HERD BOUNDARY AND CRUCIAL RANGE

TABLE 3-8

Crucial Bison Range

| Allotment | Acres | | |
|---|---|---|---|
| | Crucial Bison Summer Range | Crucial Bison Winter Range | Crucial Bison Yearlong Range |
| Blue Bench | 890 | | |
| Bullfrog | | 3,564 | |
| Burr Point | 1,660 | | |
| Cedar Point | 787 | | |
| Crescent Creek | 8,832 | | |
| Dry Lakes | 10,163 | | |
| Hanksville | 2,160 | | |
| Nasty Flat | 8,253 | | 9,088 |
| Pennell | 35,162 | 1,426 | 10,048 |
| Sandy 2 | | 13,075 | |
| Sawmill Basin | 9,540 | | |
| Steele Butte | 4,530 | 14,638 | 3,129 |
| Trachyte | 1,245 | | |
| Total | 83,222 | 32,703 | 23,245 |

Source: USDI, BLM, 1981.

TABLE 3-9

Estimated Current Bison Numbers and Forage Requirements[a]

| Allotment | Crucial Bison Winter Range | | Crucial Bison Summer Range | | Crucial Bison Yearlong Range | |
|---|---|---|---|---|---|---|
| | No. of Animals | AUMs[b] | No. of Animals | AUMs[b] | No. of Animals | AUMs[b] |
| Blue Bench | | | 2 | 17 | | |
| Bullfrog | 14 | 49 | | | | |
| Burr Point | | | 2 | 17 | | |
| Cedar Point | | | 2 | 17 | | |
| Crescent Creek | | | 10 | 85 | | |
| Dry Lakes | | | 8 | 68 | 12 | 144 |
| Hanksville | | | 2 | 17 | | |
| Nasty Flat | | | 62 | 527 | 21 | 252 |
| Pennell | 4 | 14 | 78 | 663 | 32 | 384 |
| Sandy 2 | 54 | 189 | 2 | 17 | | |
| Sawmill Basin | | | 17 | 145 | | |
| Steele Butte | 92 | 322 | 2 | 17 | 2 | 24 |
| Trachyte | | | 2 | 17 | | |
| Total | 164 | 574 | 189 | 1,607 | 67 | 804 |

Source: Felthousen, 1981.

[a]Bison numbers include adults and yearlings.

[b]Conversion factor: 1 bison/AUM (AUMs shown are calculated based on number of animals shown).

Bison from the Henry Mountain herd.

The estimated population of bison is 200 mature animals and 90 calves and yearlings (Felthousen, 1981). This estimate is based on data collected by Van Vuren (1979a; 1979b) and Nelson (1965) as well as aerial and ground survey trend data collected by UDWR (1981b). These data also suggest that, since 1964, the Henry Mountain bison herd has increased at an average annual rate of 9 percent. The estimated seasonal distribution of bison is shown by allotment in Table 3-9.

## Pronghorn Antelope

A portion of antelope herd unit 9 (San Rafael) is located in the planning area (Figure 3-4). There are approximately 318,000 acres of yearlong antelope rangistributed as follows:

| Allotment | Acres |
|---|---|
| Blue Bench | 25,088 |
| Burr Point | 49,504 |
| Cedar Point | 30,592 |
| Hanksville | 85,632 |
| North Bench | 370 |
| Robbers Roost | 64,089 |
| Rockies | 32,544 |
| Trachyte | 14,003 |
| Waterpocket | 12,281 |
| Wild Horse | 3,975 |
| Total | 318,078 |

The only crucial antelope habitat is fawning grounds near water sources. In general, this range is in fair habitat condition.

Actual census data for antelope is not available. However, small herds have been observed on the Blue Bench, Wild Horse, Hanksville, Burr Point, Trachyte, Robbers Roost, Little Rockies, and Cedar Point Allotments. Estimates of antelope numbers are shown in Table 3-10. The current population trend is considered stable (UDWR, 1981c)

## Desert Bighorn Sheep

There are approximately 517,000 acres of yearlong desert bighorn sheep range (UDWR, 1980a) (see Figure 3-5). This range is distributed as follows:

| Allotment | Acres |
|---|---|
| Burr Point | 25,709 |
| Cedar Point | 18,900 |
| Flint Trail | 115,389 |
| Hanksville | 2,976 |
| Robbers Roost | 117,984 |
| Rockies | 73,280 |
| Sewing Machine | 81,183 |
| Trachyte | 4,589 |
| Total | 440,010 |

In general, this range is in a mid-seral stage. The only crucial habitat is lambing and rutting grounds.

Actual census data is not available. However, small remnant bands are known to exist on the Wild Horse, Flint Trail, Rockies, Robbers Roost, and Sewing Machine Allotments as well as the Little Rockies area (UDWR, 1981c). Estimates of desert bighorn sheep numbers are shown in Table 3-11. According to Dalton et al. (1978), populations are increasing. However, this trend is more reflective of transplant programs rather than natural herd productivity.

The latest verified desert bighorn sheep sighting occurred in 1979 when nine animals were observed from the Dirty Devil Overlook (Bates and Dalton, 1981). Sheep sightings have been reported from such areas as Waterpocket Fold, Halls Creek, Little Rockies, Poison Spring Wash, and the two highest peaks of the Henry Mountains (Lowry, 1974).

## Beaver

Although beaver were once abundant, especially along the Fremont and Dirty Devil Rivers, they became scarce by 1900 (Hunt et al., 1953). Overgrazing by domestic livestock, which destroyed much of the riparian habitat, and water diversion projects for irrigation purposes were the major causes for the decline (Lowry, 1974).

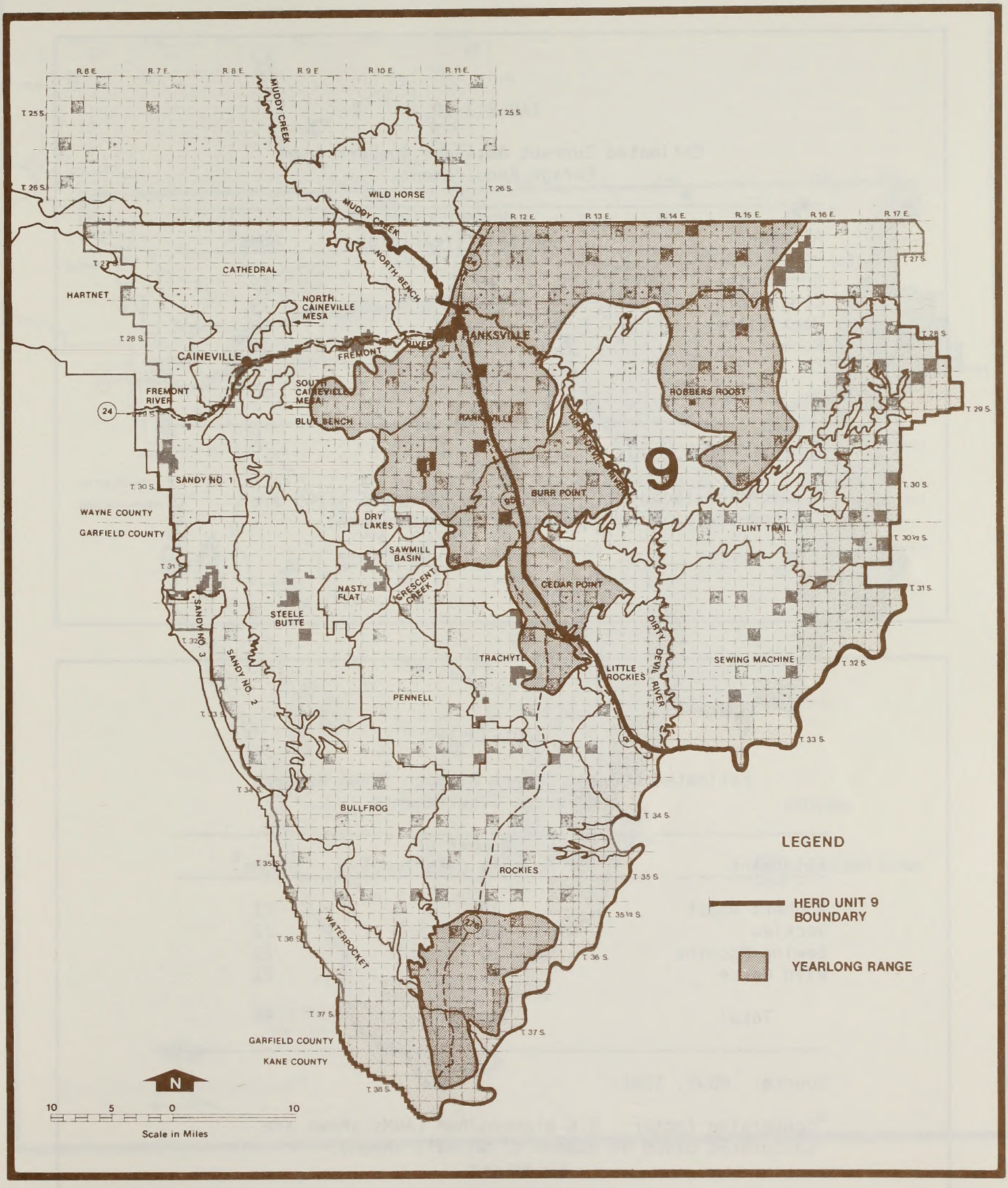



FIGURE 3-4

## ANTELOPE HERD BOUNDARY AND YEARLONG RANGE

TABLE 3-10

Estimated Current Antelope Numbers and Forage Requirements

| Allotment | Number of Animals (Yearlong) | AUMs[a] |
|---|---|---|
| Burr Point | 15 | 19 |
| Cedar Point | 15 | 19 |
| Hanksville | 15 | 19 |
| Robbers Roost | 30 | 38 |
| Total | 75 | 95 |

Source: UDWR, 1981.

[a]Conversion factor: 9.6 antelope/AUM (AUMS shown are calculated based on numbers of animals shown).

TABLE 3-11

Estimated Current Desert Bighorn Sheep Numbers and Forage Requirements

| Allotment | Number of Animals (Yearlong) | AUMs[a] |
|---|---|---|
| Robbers Roost | 10 | 21 |
| Rockies | 10 | 21 |
| Sewing Machine | 10 | 21 |
| Wild Horse | 10 | 21 |
| Total | 40 | 84 |

Source: UDWR, 1981.

[a]Conversion factor: 5.6 bighorn/AUM (AUMs shown are calculated based on number of animals shown).

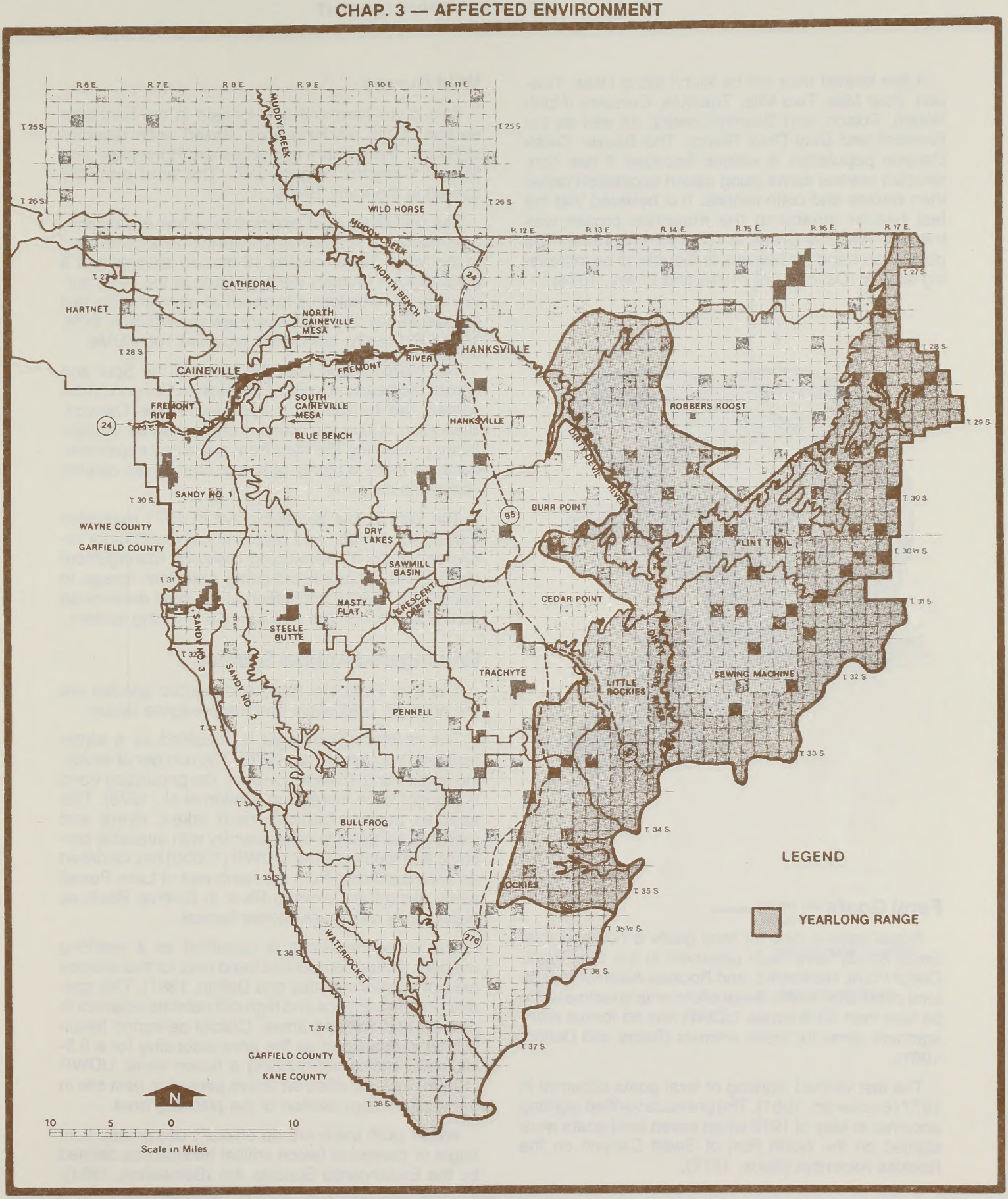



FIGURE 3-5

## DESERT BIGHORN SHEEP YEARLONG RANGE

A few beaver may still be found along Halls, Ticaboo, Four Mile, Two Mile, Trachyte, Crescent (North Wash), Poison, and Beaver Creeks, as well as the Fremont and Dirty Devil Rivers. The Beaver Creek Canyon population is unique because it has constructed several dams using desert vegetation rather than willows and cottonwoods. It is believed that the last beaver inhabiting the mountain proper was trapped from Bull Creek in 1963 (Lowry, 1974). The population trend for beavers is thought to be increasing slightly (Dalton et al., 1978 and Lowry, 1974).

## Feral Goats

Actual census data for feral goats is not available. Small bands have been observed in the Burr Point, Cedar Point, Hanksville, and Rockies Allotments. The total population within these allotments is estimated to be less than 50 animals. UDWR has no formal management plans for these animals (Bates and Dalton, 1981).

The last verified sighting of feral goats occurred in 1977 (Buchanan, 1981). The previous verified sighting occurred in May of 1976 when seven feral goats were sighted on the North Rim of Swett Canyon on the Rockies Allotment (Boos, 1976).

## Wild Burros

Wild burro herd unit 5 is located in the northeast section of the planning area. Based upon reported sightings, the primary use areas are Horseshoe and Millard Canyons (Figure 3-6). The herd probably started in the early 1940s.

The wild burro herd appears to be low at this time. The most recent BLM inventory of the herd, conducted in the fall of 1981, located 16 mature animals and 3 colts. Eleven animals were counted in the 1972 survey. The herd builds up to about 35 animals quite fast but apparently dies back every few years (USDI, BLM, 1974). Presently, burros are provided 100 AUMs.

The burros range from the Head of the Spur and across the head canyons of Horseshoe Canyon. In the winter, the burros drop into Horseshoe Canyon. Starvation during the winter months may be a major factor preventing the herd from sustained expansion, because there is plenty of forage on the high country above the canyons.

The Wild Horse and Burro Act of 1971 mandates that BLM consider wild burros equally with other resource values in developing resource management plans. This includes providing sufficient forage to maintain a healthy population at the level determined desirable through the multiple-use planning system.

## Endangered Animal Species

The only Federally listed endangered species are the northern bald eagle and the peregrine falcon.

The northern bald eagle is classified as a winter resident (Hayward et al., 1976). The number of wintering eagles is unknown; however, the population trend is thought to be increasing (Dalton et al., 1978). This species prefers habitats near lakes, rivers and marshes adjacent to open country with available perching and roosting sites. UDWR (1980b) has identified an area extending from the north end of Lake Powell south along the Colorado River to Bullfrog Basin as high-priority bald eagle winter habitat.

The peregrine falcon is classified as a yearlong resident. Actual census and trend data for this species are not available (Bates and Dalton, 1981). This species prefers canyons and high cliff habitats adjacent to riparian and wetland areas. Crucial peregrine falcon habitat is described as the area extending for a 0.5-kilometer radius surrounding a falcon aerie. UDWR (1980b) has identified an active peregrine nest site in the southeastern section of the planning area.

Within Utah there are no officially designated bald eagle or peregrine falcon critical habitats, as defined by the Endangered Species Act (Bohwahnn, 1981).

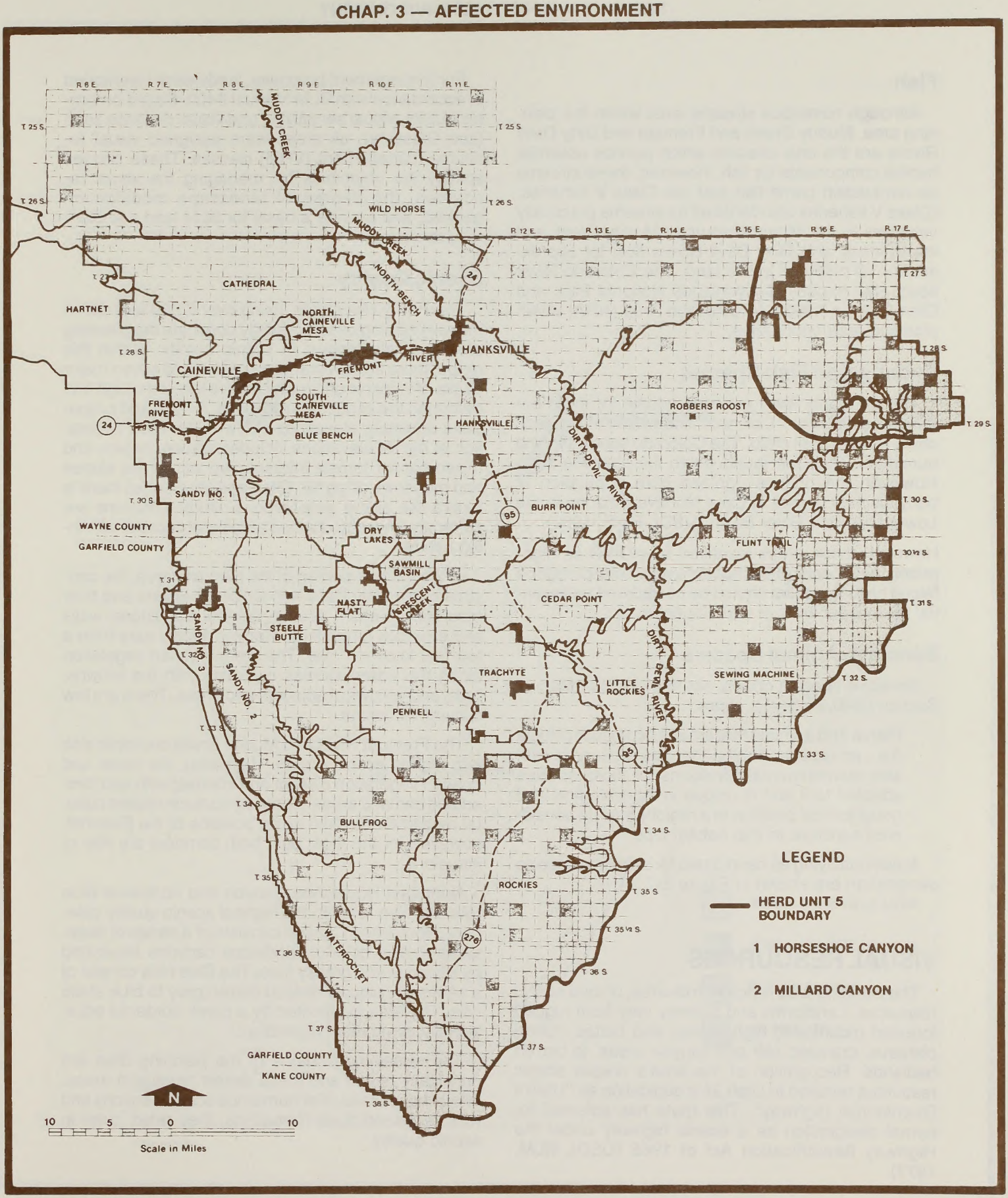



FIGURE 3-6

## WILD BURRO HERD BOUNDARY AND GENERAL LOCATIONS

### Fish

Although numerous streams exist within the planning area, Muddy Creek and Fremont and Dirty Devil Rivers are the only streams which provide essential habitat components for fish. However, these streams do not sustain game fish and are Class V fisheries. (Class V fisheries are identified as streams practically valueless to the fishery resource.) Muddy Creek and the Fremont and Dirty Devil Rivers flow for approximately 73 miles on public land. The Colorado River flows only through Canyonlands National Park and Glen Canyon National Recreation Area (NRA) within planning area boundaries.

### Endangered Fish Species

The Colorado River provides habitat for three endangered species: Colorado squawfish, humpback chub, and bonytail chub. The Colorado squawfish and humpback chub are found within the planning area. However, the only recognized pure population of bonytail chub occurs in Lake Mohave, Arizona in the Lower Colorado River Basin (USDI, FWS, 1982).

However, those areas identified by UDWR as high-priority bald eagle winter habitat and crucial peregrine falcon nesting habitat should be considered as essential for maintenance of these species.

### Sensitive Animal Species

Sensitive species criteria set forth in BLM Manual Section 6840.34 (B)(5), states:

> Plants and animals that inhabit ecological refugia (i.e., an isolated habitat that has preserved suitable environmental conditions for those species adapted to it and is unique in its ecological and geographical position in a region) may be considered sensitive in that habitat type.

Areas qualifying as candidates for sensitive species designation are shown in Figure 3-7.

## VISUAL RESOURCES

The planning area is rich with diverse, unique scenic resources. Landforms and scenery vary from rugged forested mountains, high mesas and buttes, rolling plateaus, dramatic cliff and canyon areas, to barren badlands. Recognition of the area's unique scenic resources resulted in Utah 95's dedication as "Utah's Bicentennial Highway". This route has potential for formal designation as a scenic highway under the Highway Beautification Act of 1965 (USDI, BLM, 1977).

For management purposes, lands were inventoried in accordance with BLM Manual 8400. Based on scenic quality, visual sensitivity, and visual distance zone (see Glossary), all areas were assigned visual resource management (VRM) classes. These classes specify the objectives for managing the visual resources, the degree of landscape modification allowed, and provide a basis for BLM land use planning decisions.

### Scenic Quality

The Henry Mountains, rising over 6,000 feet above the surrounding desert, visually dominate the planning area and rate highest in scenic quality. Within this range, there are several large basins and seven major peaks of volcanic origin which have thrust through and deformed the sandstone rockbeds. Pinyon and juniper trees dominate elevations below 8,000 feet. Vegetation at higher elevations includes spruce, aspen, and mixed conifer forests interspersed with grass slopes and meadows. Atop Mt. Ellen and Mt. Pennell there is tundra-like alpine vegetation. Cultural intrusions are generally limited to chained areas and occasional mining cabins.

In the eastern portion of the planning area, the canyons of the Dirty Devil and Colorado Rivers and their tributaries present scenic, colorful sandstone walls and slickrock formations. Canyon widths vary from a few feet to over 1 mile. The green riparian vegetation along the water courses contrasts with the browns, reds, and yellows of adjacent arid areas. There are few cultural intrusions.

The Fremont River and Muddy Creek corridors also rate high in scenic quality. Here also, the water and riparian vegetation dissect and contrast with arid desert and badland areas. Some agriculture-related cultural modifications exist along portions of the Fremont; however, for the most part, both corridors are free of intrusions.

Northeast Horseshoe Canyon and northwest Blue Hills are also rated in the highest scenic quality category. Horseshoe Canyon consists of a series of deep, steep-walled, colorful sandstone canyons separated by slickrock and grassy flats. The Blue Hills consist of a series of uniquely eroded barren grey to blue shale hills. The area is bisected by a creek bordered occasionally by riparian vegetation.

The remaining portions of the planning area are principally bench and mesa desert rangeland areas. While these areas offer numerous scenic canyons and rock and sand dune formations, they rated lower in scenic quality.

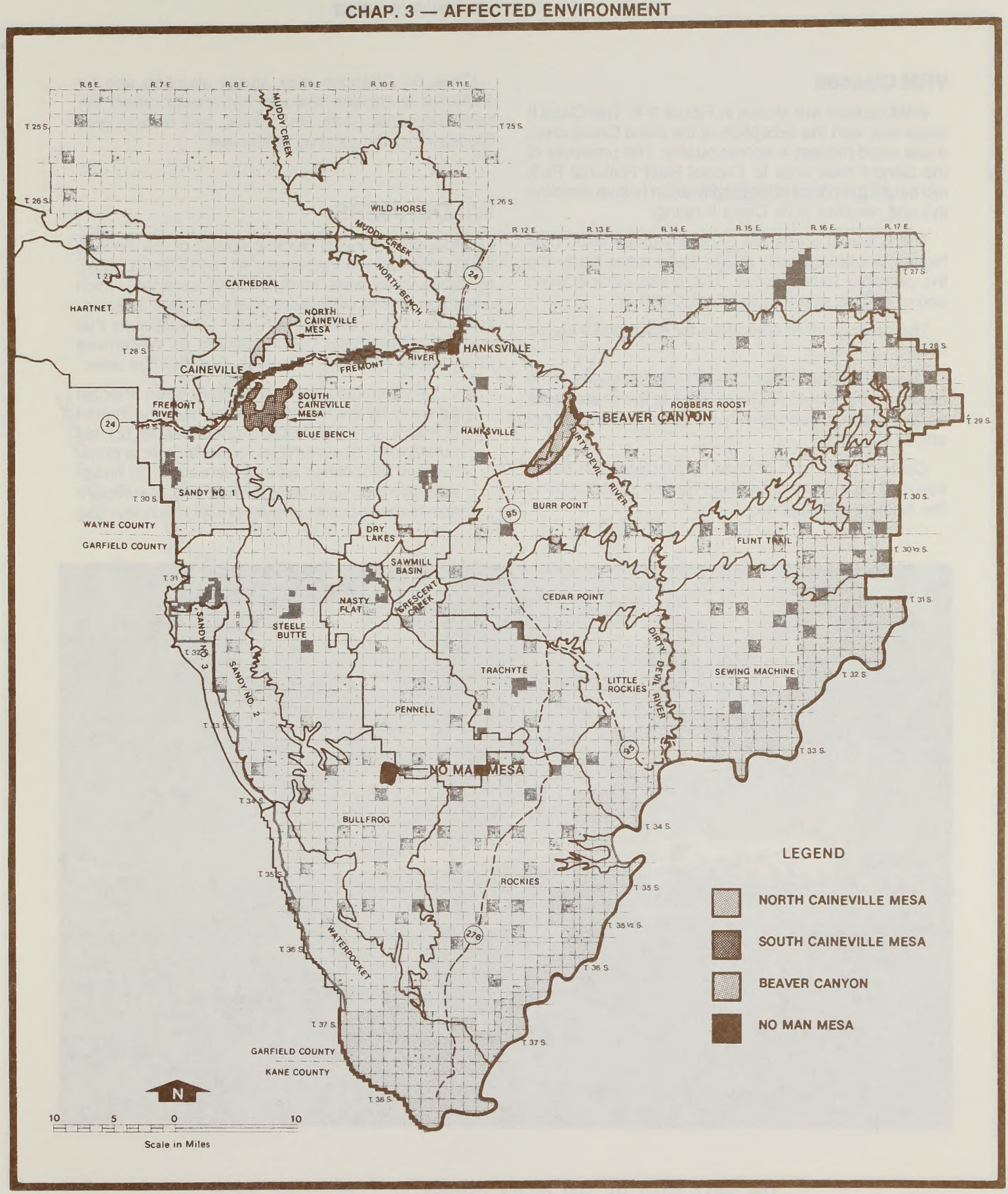



FIGURE 3-7

## SENSITIVE PLANT AND ANIMAL SPECIES HABITATS

## VRM Classes

VRM classes are shown in Figure 3-8. The Class II areas are, with the exception of the Sand Creek area, those rated highest in scenic quality. The proximity of the Sand Creek area to Capitol Reef National Park increases the concern for modification (visual sensitivity) and resulted in its Class II rating.

The Class III areas are generally those rated next highest in scenic quality and/or those areas bordering the principal travel routes. The areas seldom seen and/or of less scenic quality are Class IV.

The management objectives for each class are as follows:

*Class II.* Management activities/modifications of the environment should not be evident in the characteristic landscape. Changes may be visible but should not attract attention.

*Class III.* Changes caused by management activities may be evident but should remain subordinate to the existing landscape.

*Class IV.* Changes may attract attention and be dominant landscape features but should reflect the basic elements (form, line, color, and texture [see Glossary]) of the existing landscape.

## WILDERNESS

Under provisions of Section 603(c) of the Federal Land Policy and Management Act of 1976 (FLPMA), all public lands were inventoried to ascertain which lands possessed wilderness characteristics as specified in the Wilderness Act of 1964. Those lands that met the criteria have been identified as Wilderness Study Areas (WSAs). The criteria are that the area:

> . . . (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size to make practicable its preservation and use

The west side of the Henry Mountains from Notom Road.

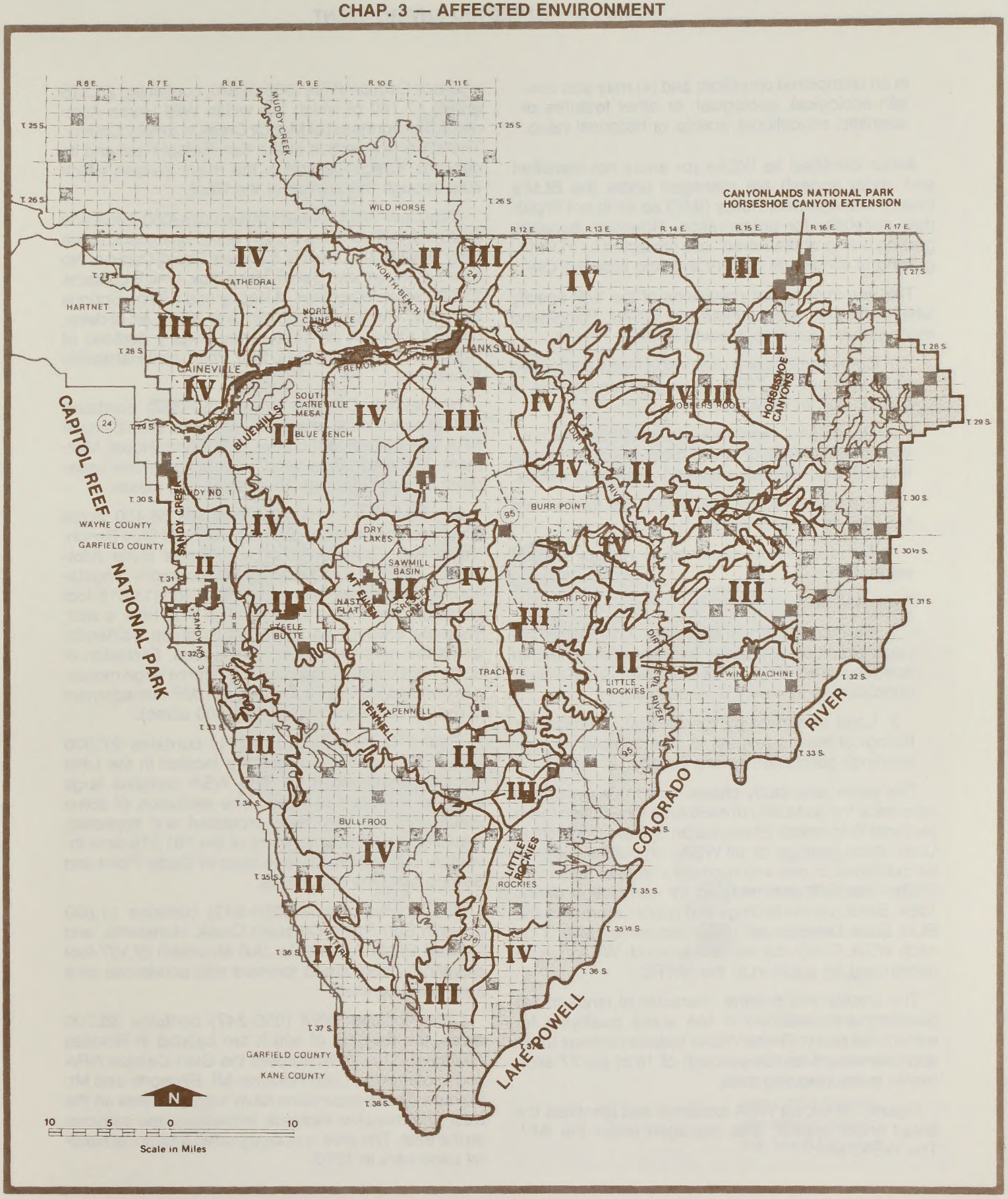



FIGURE 3-8

## VISUAL RESOURCE MANAGEMENT CLASSES

in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Areas identified as WSAs (or areas not identified and under appeal) are managed under the BLM's Interim Management Policy (IMP) so as to not impair their suitability for preservation. However, because grazing is a "grandfathered" use protected by FLPMA, grazing is allowed at current average licensed use.

The non-impairment provisions of the IMP specify which activities are permitted in WSAs. Rangeland management activities allowed include:

1. Continued grazing use on the lands authorized as of October 21, 1976, as long as the impacts of grazing do not increase.

2. Rangeland improvements which satisfy non-impairment criteria or which meet specified criteria and enhance natural rangeland wilderness values.

3. Prescribed burns where required to maintain fire-dependent ecosystems.

4. Hand or aerial seedings to restore natural vegetation.

Prohibited activities include:

1. Surface-disturbing activities, unless the impacts would be temporary and reclamation (within specified time limits) to a condition substantially unnoticeable in the WSA is possible.

2. Land treatment by mechanical, chemical, or biological means (except to maintain plantings or seedings conducted before October 21, 1976).

The wilderness study phase, now in progress, will determine the suitability of each area for addition to the National Wilderness Preservation System (NWPS). In Utah, study findings for all WSAs on public lands will be published in one environmental impact statement (EIS). That EIS is scheduled for completion during 1984. Based on the findings and public comments, the BLM State Director will make recommendations on each WSA. Congress will decide which WSAs will be designated for addition to the NWPS.

The unique and pristine character of lands in the planning area resulted in ten areas qualifying for wilderness study. These WSAs include portions (from approximately 5 to 100 percent) of 18 of the 27 allotments in the planning area.

Figure 3-9 shows WSA locations and identifies the areas under appeal, also managed under the IMP. The WSAs are:

*Crack Canyon WSA* (060-028A), containing 25,315 acres, 17,180 of which are within Wild Horse Allotment, lies northeast of Muddy Creek in Emery County. The WSA is a portion of the San Rafael Reef and its canyons; Crack Canyon is the major canyon which cuts through this portion of the Reef.

*Dirty Devil WSA* consists of two units (050-236A and 236B). Unit A contains 61,000 acres in portions of the Dirty Devil River Canyon, Robbers Roost Canyon, No Man's Canyon, and Sam's Mesa Box. Unit B contains 25,000 acres in portions of Happy and French Springs Canyons. These units contain over 100 miles of deep, colorful slickrock canyons. They occupy portions of Robbers Roost, Flint Trail, Burr Point, and Hanksville Allotments.

*Horseshoe Canyon WSA* (050-237) contains 38,000 acres, most of which borders the Glen Canyon NRA in the northeast corner of Robbers Roost Allotment. The area offers deep, slickrock canyons separated by sparsely vegetated tables and mesas.

*Mt. Ellen WSA* (050-238) contains 58,480 acres which includes Dry Lakes and portions of Blue Bench, Nasty Flat, Sawmill Basin, and Steele Butte Allotments. There is a wide variety in topography, vegetation, and life zones in the area. Mt. Ellen (11,615-foot elevation) dominates the area. The Blue Hills, a vast, uniquely eroded, barren Mancos shale badlands, forms the northern portion of the area. Exclusion of some surrounding areas, including three large mesas, has been appealed. This resulted in IMP management of the entire inventory unit (156,000 acres).

*Fiddler Butte WSA* (050-241) contains 27,000 acres, the majority of which are located in the Little Rockies unallotted area. The WSA contains large areas of slickrock canyons. The exclusion of some areas from the WSA was protested and appealed, resulting in IMP management of the 101,310-acre inventory unit, which includes most of Cedar Point and Sewing Machine Allotments.

*Bull Mountain WSA* (050-242) contains 11,800 acres in Burr Point, Crescent Creek, Hanksville, and Sawmill Basin Allotments. Bull Mountain (9,187-foot elevation) offers areas forested with ponderosa pine and mixed conifers.

*Little Rockies WSA* (050-247) contains 38,700 acres, the majority of which are located in Rockies Allotment. This WSA borders the Glen Canyon NRA and contains the Little Rockies: Mt. Ellsworth and Mt. Holmes. These mountains have rugged slopes on the west and massive slickrock formations and canyons on the east. The area was designated a National Natural Landmark in 1975.

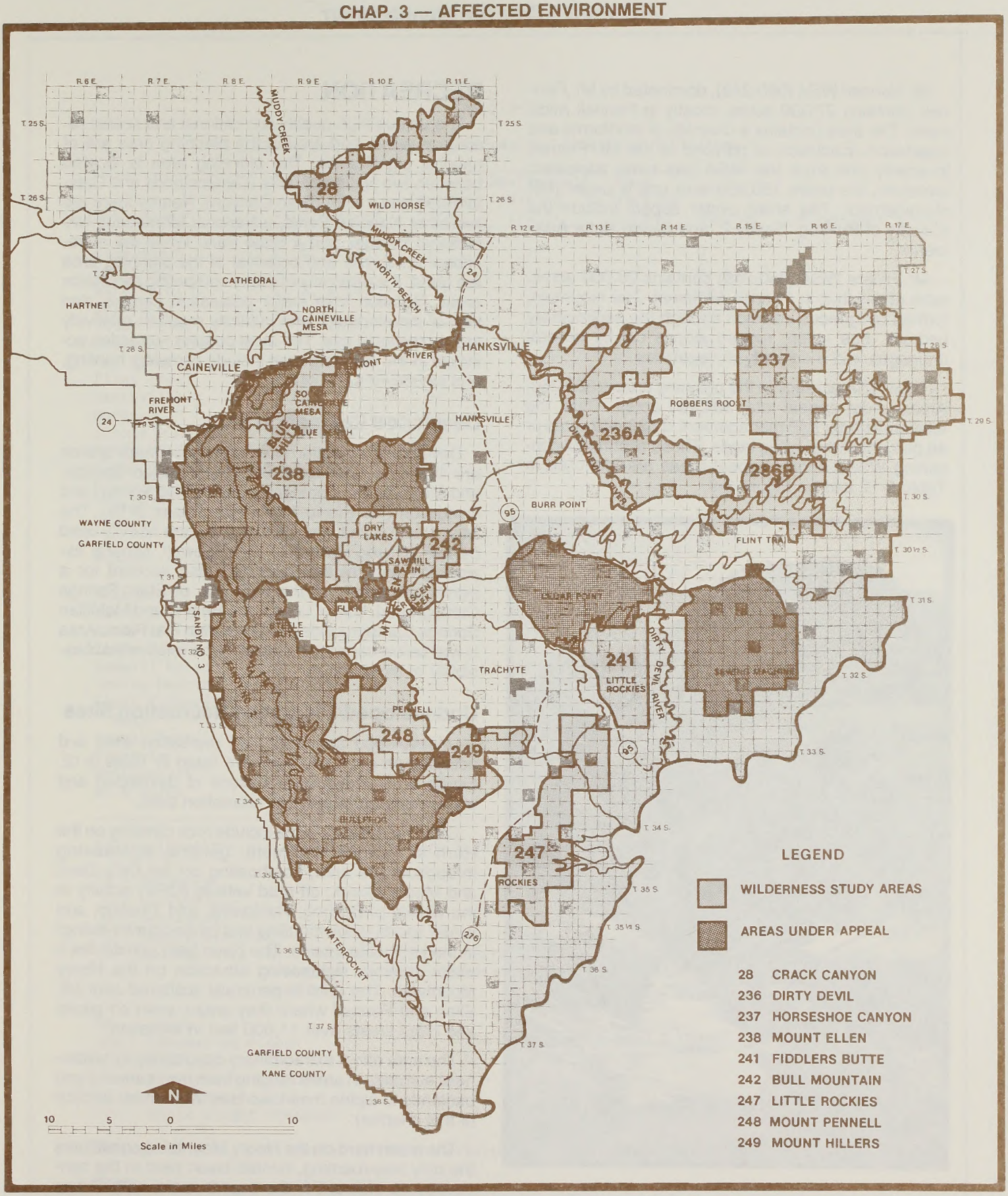


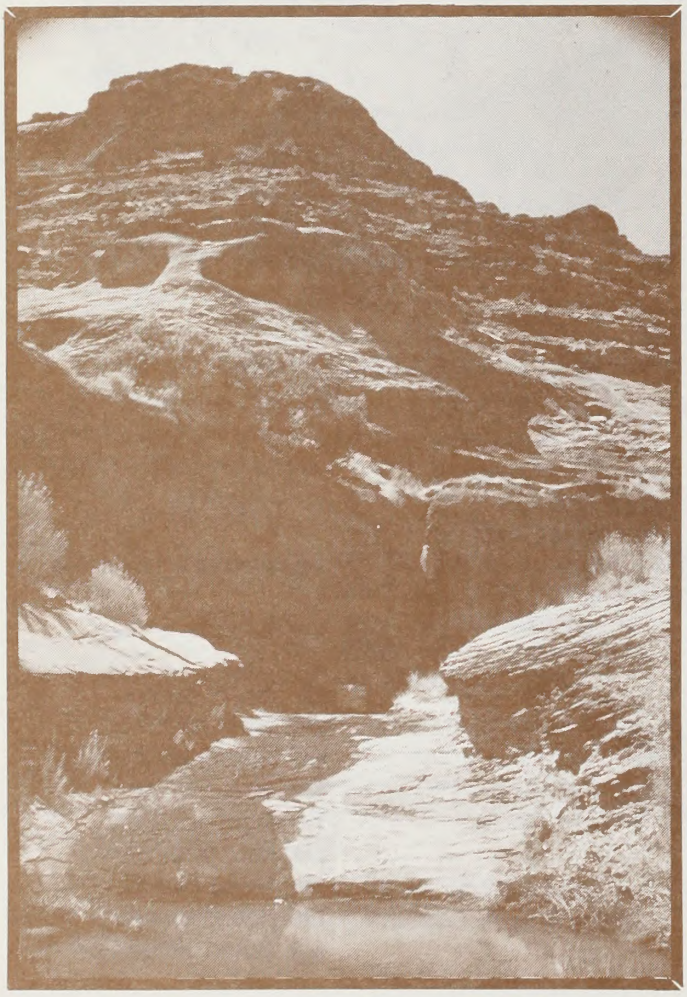

FIGURE 3-9

## WILDERNESS STUDY AREAS

*Mt. Pennell WSA* (050-248), dominated by Mt. Pennell, contains 27,300 acres, mostly in Pennell Allotment. The area contains a diversity of landforms and vegetation. Exclusion of portions of the Mt. Pennell inventory unit from the WSA has been appealed; therefore, the entire 159,650-acre unit is under IMP management. The areas under appeal include the majority of Bullfrog, Sandy 2, and Steele Butte Allotments.

*Mt. Hillers WSA* (050-249) contains 20,000 acres, most of which is in Pennell Allotment. The mountain, formed by igneous intrusion through the sedimentary bedrock, has steep, rugged slopes cut by several drainages and a diversity of vegetation.

Total WSA acreage in the planning area is 325,260. Areas under appeal total 304,180 acres. Thus, the total area under IMP management is 629,440 acres or 48 percent of the public lands. Those allotments containing WSAs and/or appeal areas are identified in Table 3-12 and on Figure 3-9.



Hog Springs Trail.

## RECREATION

The unique high quality recreational and scenic resources within and around the planning area are of national significance. The planning area is located between two National Parks (Canyonlands and Capitol Reef) and a NRA (Glen Canyon). Nearby there are two other National Parks, a National Monument, two National Forests, and a State Park. While the recreational resources and potential of the planning area are great, the proximity of these competing recreation areas, isolation from major population centers, and lack of development and publicity result in relatively low recreational use. The most popular recreation activities in the planning area include camping, hunting, and sightseeing.

### Developed Recreation Sites

Developed recreation sites within the planning area are limited to Lonesome Beaver, McMillan Springs, and Starr Springs Campgrounds and Hog Springs and Dandelion Flat Picnic Areas (see Figure 3-10). The Starr Springs and Hog Springs sites are heavily used by tourists and visitors to Lake Powell. Mineral exploration and mining personnel also account for a significant portion of the high use of Starr Springs Campground. Use of Lonesome Beaver and McMillan Springs Campgrounds and Dandelion Flat Picnic Area is well below capacity because of the relative inaccessibility of those areas.

### Undeveloped/Dispersed Recreation Sites

Undeveloped and dispersed recreation sites and activities on each allotment are listed in Table 3-12. Figure 3-10 shows the locations of developed and undeveloped or dispersed recreation sites.

Other recreational uses include rock climbing on the Horn in Pennell Allotment; general sightseeing throughout the area; floatboating on the Dirty Devil and Muddy Creek; off-road vehicle (ORV) activity in the vicinity of Bullfrog, Hanksville, and Ticaboo; and winter sports (snowmobiling and cross-country skiing) in the Henry Mountains. The bison herd constitutes a major summer sightseeing attraction on the Henry Mountains. The herd is generally scattered over Mt. Ellen and Pennell where they graze, even on peaks and ridge crests over 11,000 feet in elevation.

The area offers extraordinary opportunity for wilderness activities in areas ranging from river canyons and badlands to alpine meadows (see Wilderness section of this chapter).

The bison herd on the Henry Mountains constitutes the only free-roaming, hunted bison herd in the contiguous 48 states. For the past 3 years, UDWR has

TABLE 3-12

Undeveloped Dispersed Recreation Sites and Activities

| Allotment | Sightseeing[a] | Camping Sites | Designated Hiking Trails | Rock Collecting Sites | Hunting[b] | Wilderness[c] |
|---|---|---|---|---|---|---|
| Blue Bench | C, G, Z (A) | -- | -- | 1 | D | 1 |
| Bullfrog | S | 1 | -- | 1 | B, Ck, D | 1 |
| Burr Point | C, S, Z (A) | -- | -- | -- | Ck | 2 |
| Cathedral | G | -- | -- | 2 | D, P | 0 |
| Cedar Point | G, Z, (A) | -- | -- | -- | Ck | 1 |
| Crescent Creek | -- | -- | -- | -- | Bp, D, G | 1 |
| Dry Lakes | G | -- | -- | -- | Bp, D, G | 1 |
| Flint Trail | Z (BS) | -- | -- | -- | -- | 2 |
| Hanksville | Z (A) | -- | -- | 2 | Ck | 3 |
| Hartnet | -- | -- | -- | -- | -- | 0 |
| Little Rockies | Z (A & BS) | 1 | 1 | -- | Ck | 2 |
| Nasty Flat | S | 1 | 1 | 1 | B, Bp, D, G | 1 |
| North Bench | -- | -- | -- | -- | -- | 0 |
| North Caineville Mesa | -- | -- | -- | -- | -- | 0 |
| Pennell | G, S | 12 | -- | 1 | B, Bp, Ck, D, G | 2 |
| Robbers Roost | C, S, Z (A, Bu, BS) | -- | 1 | -- | -- | 3 |
| Rockies | C, G, S, Z (BS) | -- | 1 | -- | Ck, D | 2 |
| Sandy 1 | C | 1 | -- | 1 | Ck | 0[d] |
| Sandy 2 | -- | -- | -- | -- | B, Ck | 0[d] |
| Sandy 3 | G | -- | -- | -- | Ck | 0 |
| Sawmill Basin | B | 1 | 1 | -- | Bp, D, G | 2 |
| Sewing Machine | Z (BS) | -- | -- | -- | -- | 1 |
| South Caineville Mesa | -- | -- | -- | -- | -- | 0[d] |
| Steele Butte | B | -- | -- | -- | B, D | 2 |
| Trachyte | -- | -- | -- | -- | Ck, D | 2 |
| Waterpocket | S | 1 | 1 | -- | Ck | 0[d] |
| Wild Horse | Z (A, BS) | -- | -- | -- | -- | 1 |

Note: Locations are depicted on Figure 3-10.

[a] B - Botanical
C - Cultural
G - Geological
S - Scenic Overlook
Z - Zoological: (A) - Antelope, (Bu) - Burro, (BS) - Bighorn Sheep. (Bison are found throughout the Henry Mountains [see Table 3-11]. Location varies seasonally).

[b] B - Bison
Bp - Bandtailed Pigeon
Ck - Chukar
D - Deer
G - Blue Grouse
P - White Winged Pheasant

[c] Number of WSAs, portions of which are within the allotment boundary.

[d] Contains area under WSA appeal.

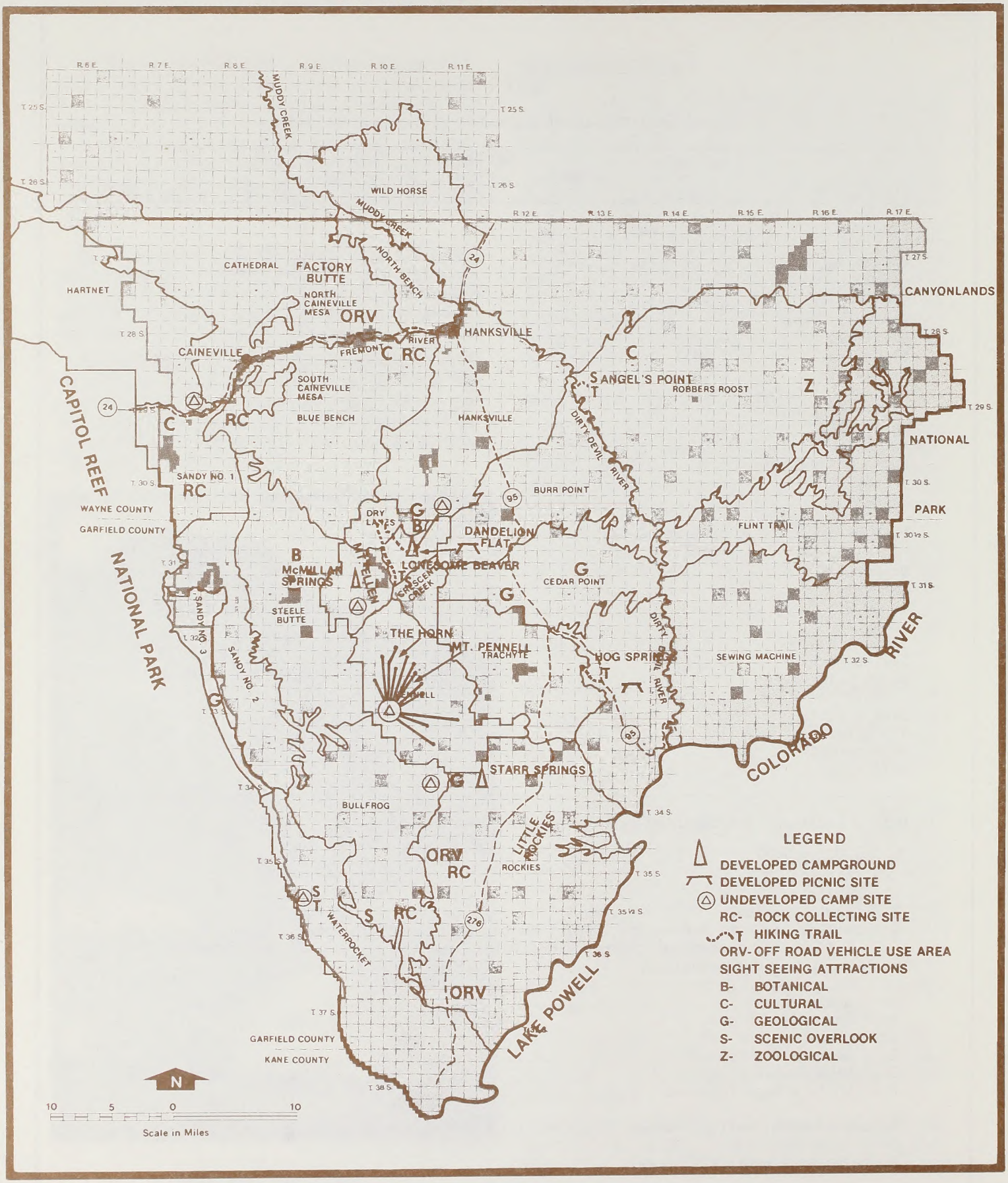



FIGURE 3-10

## RECREATION AREAS

issued approximately 25 once-in-a-lifetime permits annually for sportsmen to hunt bison. There is also a herd of mule deer in the Henrys. To accommodate the deer herd population increases, hunting has been restricted to 1-week trophy buck-only hunts in recent years. In 1980, estimated hunter days for bison and deer were 180 and 208, respectively. Population growth in the area and the state is expected to significantly increase the demand for opportunity and amount of hunting activity in the next decade.

## CULTURAL RESOURCES

### Archaeology

The planning area contains a rich and varied cultural resource base (see Figure 3-11). Approximately 706 sites have been recorded thus far, representing human activity beginning almost 14,000 years ago and continuing to the present day.

Five distinctive prehistoric cultures are represented. The earliest is the Clovis Culture of the Paleo-Indian tradition, which has been radiocarbon dated from approximately 12,000 to 9,000 B.C. Following the Clovis Culture in the Western United States was the Folsom Culture, also part of the Paleo-Indian tradition, dating from approximately 10,000 to 7,000 B.C. Both cultures are evidenced today by highly distinctive fluted projectile points, the Clovis Point and the Folsom Point.

CLOVIS POINT

FOLSOM POINT

The Paleo-Indian tradition, beginning at least by 12,000 B.C., was eclipsed by the onset of warmer, drier climatic conditions, and the subsequent extinction of megafauna (i.e., mammoths and bison) at about 7,000 B.C. Though only two recorded sites indicate Paleo-Indian occupation in the planning area, more surely exist.

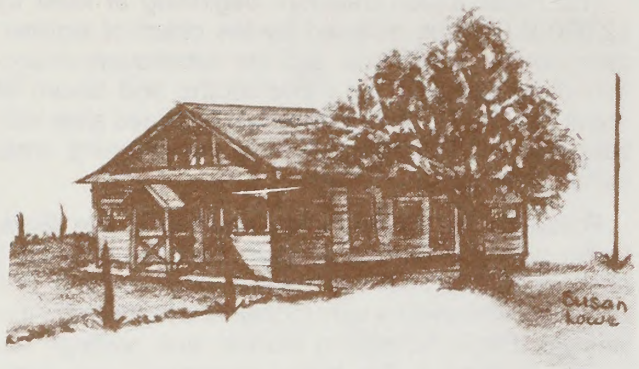
Following the Paleo-Indian tradition in the Great Basin was the Desert Archaic Culture, appearing about 7,500 B.C. These people were hunters and gatherers who lived a very mobile and highly adaptive lifestyle. Basketry, milling stones, and cordage are typical remains in the better preserved cave sites, such as Cowboy Caves, excavated by the University of Utah. The Archaic lifeway showed little change for thousands of years, probably because of comparative environmental stability. There are two sites in the planning area known to have an Archaic component.

About the time of Christ, agriculturally based cultures in the Southwest were developing from the Desert Archaic lifeway. The Colorado River seems to form a sharp northern boundary for these people, the Anasazi. The Anasazi had sizable villages and placed great emphasis on arts, crafts, and religion. Several sites exhibit some Anasazi occupation.

The Fremont people occupied most of Utah from about A.D. 400 to A.D. 1200 or 1300. Though based on only a few tree-ring dates, the Fremont culture is believed to have coalesced definably by at least A.D. 700. Fremont villages were generally small, and were typically located well above arable land. Seventy-five sites have been defined as having a Fremont component present. Excavations of Fremont sites have been concentrated in the Bull Creek area south of Hanksville, recently listed on the National Register of Historic Places as the Bull Creek Archaeological District. This District is significant for the variety and types of archaeological sites and information found there.

About A.D. 1200 or 1300, the aboriginal occupation of the area and most of the northern Southwest declined precipitously. Several explanations have been offered as possible reasons for the mass depopulation; however, none have been conclusively demonstrated as being the major cause.

The Shoshoni-speaking Paiute took over the territory after the Fremont disappeared, and occupied it until White contact in the nineteenth century. They apparently migrated east from southern California and Nevada, and lived a basically Archaic hunting and gathering lifestyle. One Paiute site is known to exist in the planning area.



## History

Because of its geographical isolation and difficulty of access, the Hanksville area was unexplored until comparatively recent times and, therefore, its written history is somewhat sparse. The earliest record of white man in this region is a date of "1692" etched in the sandstone of Halls Crossing. However, it is not known if the engraving is authentic. In 1776, the Dominquez-Escalante expedition crossed the Colorado River at the Crossing of the Fathers, 80 miles south of Hanksville. Spanish trading, prospecting, and slave hunting expeditions entered Utah between 1776 and 1855, although their destination was unrecorded.

White settlers were first drawn to the Hanksville area from the St. George vicinity by free grazing and free water. Another factor attracting settlers was the outlawing of polygamy: the remoteness of the Hanksville area made it a safe haven for polygamous families.

The first stock-raising boom occurred during the 1890s, when large cattle herds were introduced on the Henry Mountains. Ranches were built, including Starr Ranch on the south slopes of Mt. Hillers.

One of the most curious developments in the planning area was started in 1918 by Edwin Thatcher Wolverton. He and his partner built an elaborate mill to crush ore they mined at the headwaters of Straight Creek Canyon on Mt. Pennell. Wolverton visited the Henry Mountains in 1900 after he had heard legends of an old Indian gold mine. Wolverton believed he had found the exact spot of the old mine; however, he was able to produce only a small amount of low quality ore.

A mining boom began in 1883 in Bromide Basin in the Henry Mountains. The Bromide mine paid well for a short time; however, the gold was confined to a pocket and could not maintain the Town of Eagle City.

Mining developments again boomed with the need for vanadium created by World War I. The present-day Cat Ranch, formerly named the Standard Chemical Ranch, was the base of operation for extracting the ore in Trachyte Canyon. Deposits were also discovered at Temple Mountain and, much later, the United Vanadium Corporation produced ore from claims on the south fork of North Wash.

Figure 3-11 gives the locations of historical sites throughout the planning area.

## Paleontology

Many significant fossils have been found throughout the area, including vertebrate, invertebrate, plant, and micro-fossils. Pleistocene and recent sediments of many types are found and have yielded important vertebrate fossils.

The Cretaceous Mancos Shale has been broken down into five members: (1) Masuk Shale; (2) Emery Sandstone; (3) Blue Gate Shale; (4) Ferron Sandstone; and (5) Tununk Shale. All of these are exposed in the Henry Mountains.

The Mancos Shale is marine in nature and contains the following types of fossil material: fish, reptiles, ammonites, plants, and invertebrates such as clams, oysters, snails, etc.

The Jurassic Morrison Formation is well represented and is famous for the many dinosaurs that have been found in it. Dinosaurs are not the only vertebrates present in the Morrison Formation, however. There are at least 14 genera and 26 species of fossil mammals, at least one genus and species of bird, and at least three species of fish, turtle, crocodile, and lizard-like reptiles, as well as large invertebrate and plant samples. Bird and mammal remains of this age are extremely rare. The Jurassic period is also represented by a few relatively insignificant fossil remains in other formations, including a few fish, invertebrates, and an occasional dinosaur track or bone.

# LAND USE PLANS AND CONTROLS

## Local

The planning area encompasses major portions of Wayne and Garfield Counties. Garfield County administers its land use planning with *Garfield County, Utah, A Master Plan for Development* (University of Utah, Bureau of Community Development, 1979). Wayne County administers its land use planning with the *Final Report, Wayne County Master Planning Project* (Call Engineering, Inc., 1976). Both plans emphasize planning for private lands and local communities; however, the multiple use of Federal lands is recognized.

## State

The State Land Board manages State section inholdings within public lands and leases grazing and mineral resources. These lands are administered without formal land use plans.

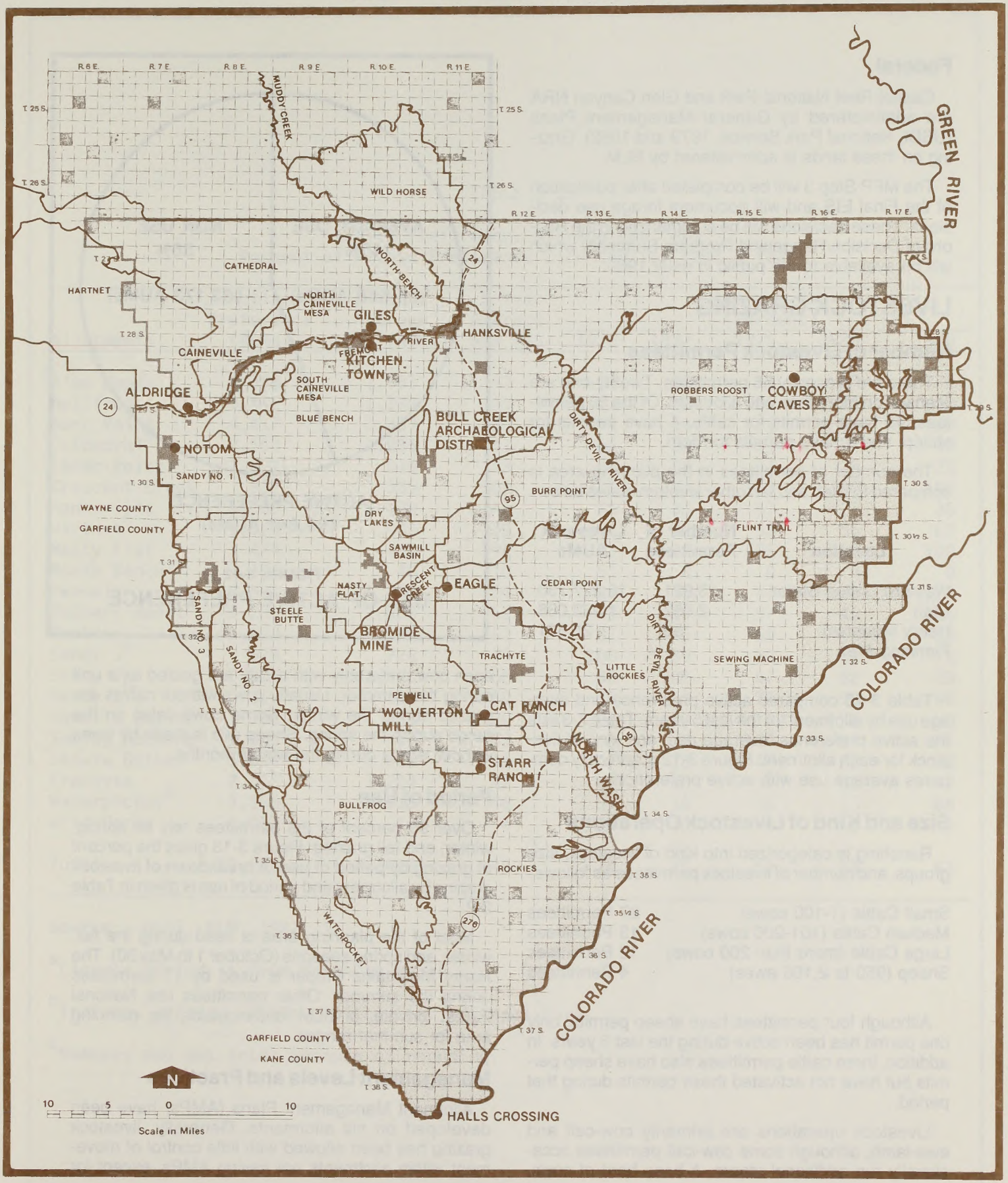



FIGURE 3-11
## ARCHAEOLOGICAL AND HISTORICAL SITES

### Federal

Capitol Reef National Park and Glen Canyon NRA are administered by General Management Plans (USDI, National Park Service, 1979 and 1982). Grazing on these lands is administered by BLM.

The MFP Step 3 will be completed after publication of the Final EIS and will document forage use decisions. These decisions will be summarized in the Record of Decision/Rangeland Program Summary which will be available to the public in early 1983.

## LIVESTOCK GRAZING

### Number of Livestock Permittees

There are presently 56 permittees. Twenty-one are licensed on more than one allotment. Of the 56 permittees, 49 have permits for cattle, 4 have permits for sheep, and 3 have permits for both.

The number of permittees in the planning area is compared to Utah and ten other western states below:

| Location | Number of Permittees | Livestock AUMs |
|---|---|---|
| Western United States | 13,821 | 10,227,730 |
| Utah | 2,057 | 1,023,088 |
| Henry Mountain Planning Area | 56 | 26,631 |

Table 3-13 compares active preference and average use by allotment for the last 5 years. Table 3-3 lists the active preference, average use, and kind of livestock for each allotment. Figure 3-12 graphically compares average use with active preference.

### Size and Kind of Livestock Operations

Ranching is categorized into kind of livestock, size groups, and number of livestock permittees as follows:

| | |
|---|---|
| Small Cattle (1-100 cows) | 27 Permittees |
| Medium Cattle (101-200 cows) | 13 Permittees |
| Large Cattle (more than 200 cows) | 12 Permittees |
| Sheep (950 to 2,100 ewes) | 4 Permittees |

Although four permittees have sheep permits, only one permit has been active during the last 5 years. In addition, three cattle permittees also have sheep permits but have not activated these permits during that period.

Livestock operations are primarily cow-calf and ewe-lamb, although some cow-calf permittees occasionally run additional steers. A base herd of cows, each cow preferably with a calf, are grazed as a unit during the summer. Usually cows without calves are grazed during the winter. Some cows calve on the range during the spring. Sheep use is made by ewes without lambs during the winter months.

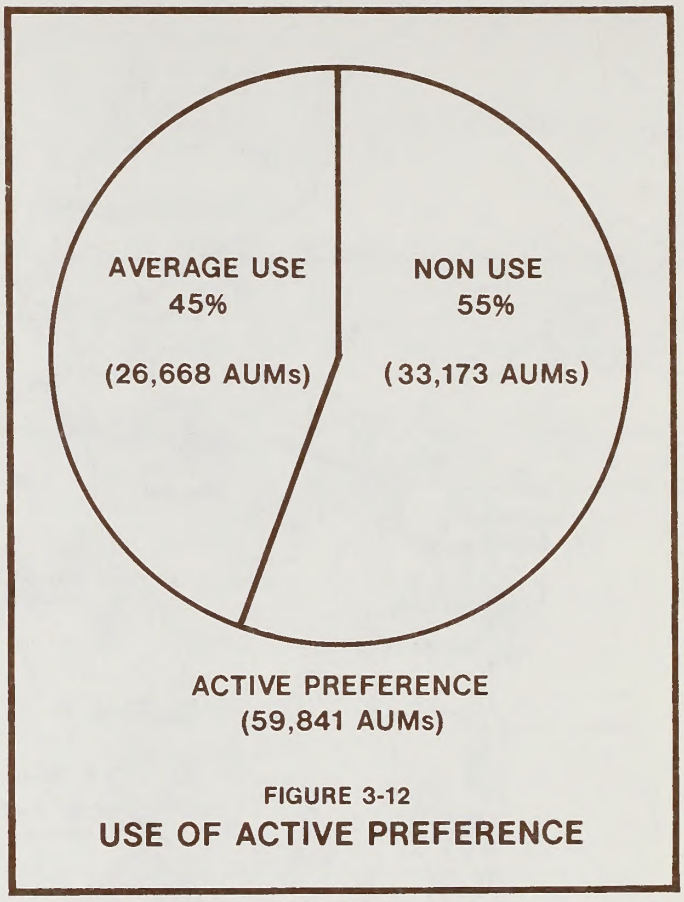



FIGURE 3-12
USE OF ACTIVE PREFERENCE

### Period of Use

Over 90 percent of the permittees rely on spring, winter, and fall grazing. Figure 3-13 gives the percent of grazing by period of use. A breakdown of livestock grazing by allotment and period of use is given in Table 2-2.

Most of the planning area is used during the fall, winter, and spring seasons (October 1 to May 30). The Henry Mountains Proper is used by 11 permittees during the summer. Other permittees use National Forest, private, or BLM lands outside the planning area for summer ranges.

### Management Levels and Practices

Allotment Management Plans (AMPs) have been developed on six allotments. Generally, livestock grazing has been allowed with little control of movement within allotments not having AMPs, except for

TABLE 3-13

Active Preference, Average Use, and
Percent of Active Preference Licensed for Past 5 Years[a]

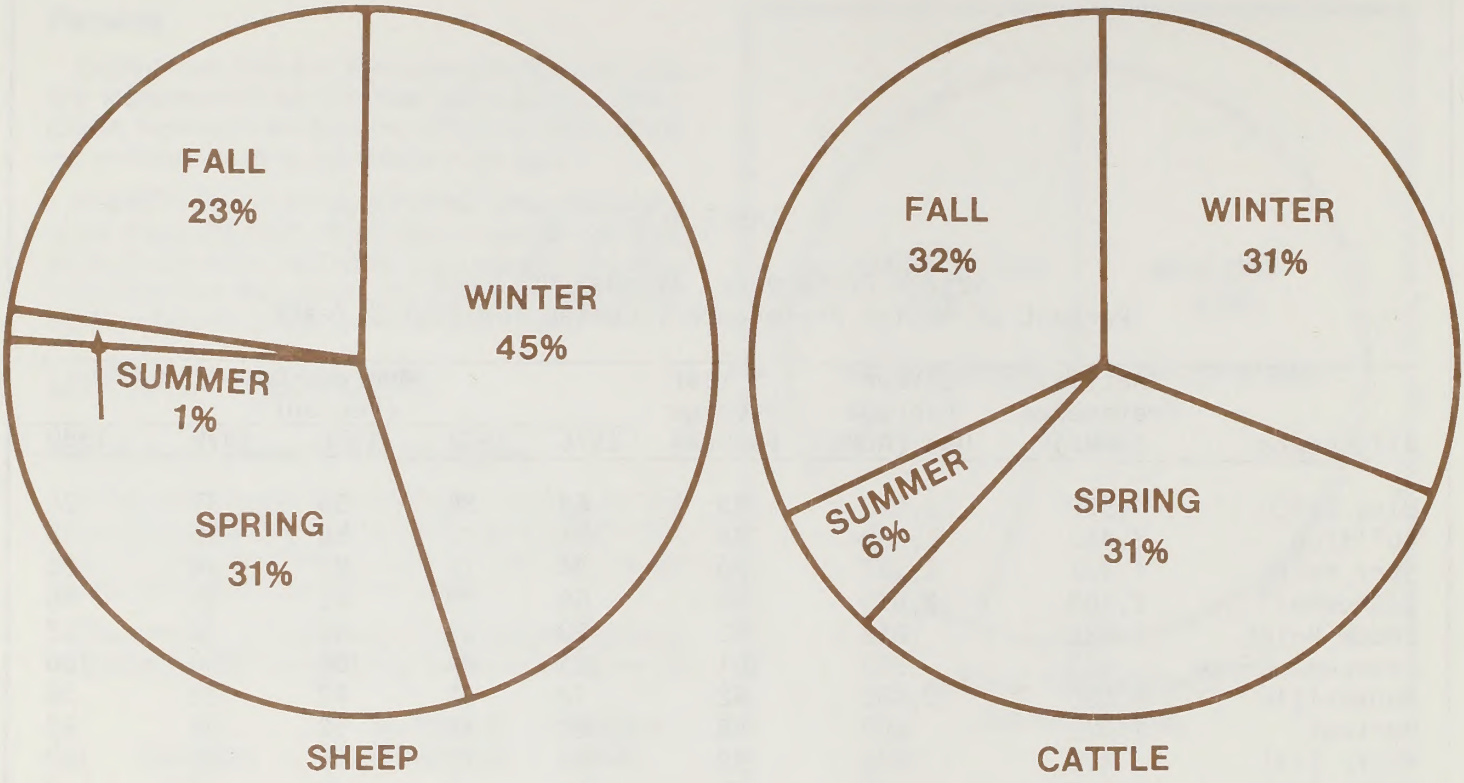
| Allotments | Active Preference (AUMs) | 5-Year Average Use (AUMs) | 5-Year Average Use (%) | Average Use (Percent) 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|
| Blue Bench | 4,598 | 1,963 | 43 | 63 | 20 | 59 | 37 | 26 |
| Bullfrog | 3,442 | 1,539 | 45 | 51 | 22 | 59 | 55 | 38 |
| Burr Point | 4,417 | 1,337 | 30 | 44 | 14 | 32 | 34 | 28 |
| Cathedral[b] | 2,503 | 1,035 | 41 | 68 | 28 | 51 | 37 | 40 |
| Cedar Point | 1,892 | 819 | 43 | 88 | 22 | 47 | 38 | 22 |
| Crescent Creek | 332 | 335 | 101 | 121 | 83 | 100 | 100 | 100 |
| Hanksville | 6,000 | 2,499 | 42 | 72 | 30 | 47 | 23 | 36 |
| Hartnet[b] | 1,021 | 603 | 59 | 84 | 40 | 52 | 56 | 62 |
| Nasty Flat | 474 | 436 | 92 | 92 | 72 | 95 | 100 | 100 |
| North Bench | 456 | 46 | 10 | 51 | 0 | 0 | 0 | 0 |
| Pennell | 2,594 | 1,391 | 54 | 88 | 25 | 67 | 70 | 18 |
| Robbers Roost | 5,288 | 2,808 | 53 | 79 | 39 | 57 | 45 | 45 |
| Rockies[b] | 5,872 | 3,588 | 61 | 81 | 6 | 60 | 68 | 88 |
| Sandy 1[b] | 978 | 728 | 79 | 100 | 39 | 82 | 82 | 72 |
| Sandy 2[b] | 2,228 | 1,509 | 68 | 88 | 88 | 57 | 82 | 25 |
| Sandy 3[b] | 305 | 184 | 60 | 78 | 2 | 76 | 99 | 46 |
| Sawmill Basin | 166 | 33 | 20 | 100 | 0 | 0 | 0 | 0 |
| Sewing Machine | 1,600 | 950 | 59 | 4 | 73 | 100 | 87 | 27 |
| Steele Butte | 5,034 | 2,066 | 41 | 97 | 18 | 44 | 22 | 23 |
| Trachyte | 2,853 | 1,204 | 42 | 63 | 15 | 30 | 61 | 42 |
| Waterpocket[b] | 3,165 | 1,518 | 48 | 97 | 10 | 38 | 26 | 68 |
| Wild Horse | 1,067 | 40 | 4 | 19 | 0 | 0 | 0 | 0 |
| Total | 56,285 | 26,631 | 49 | 74 | 29 | 52 | 51 | 43 |

Source: USDI, BLM, 1982.

[a]License period is from March to March.

[b]Includes grazing within Capitol Reef National Park.

[c]Numbers may not total because of rounding.




LIVESTOCK AUMs UTILIZED BY PERIOD OF USE

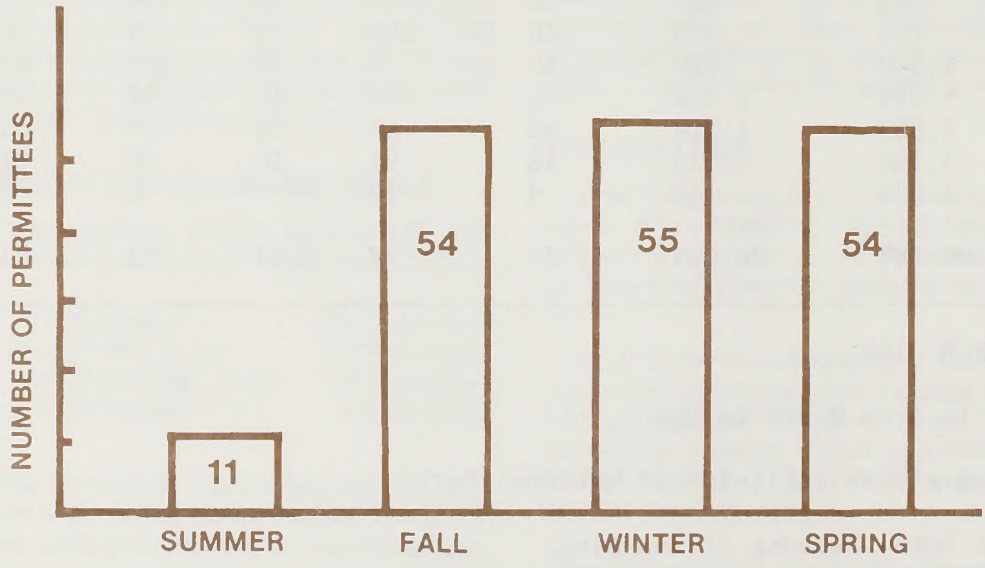



FIGURE 3-13

NUMBER OF PERMITTEES BY PERIOD OF USE

limited herding, salting, water development, or fencing. Individual permittee's practices vary depending on their time on the job (full or part time), breeding programs, breeds of cattle, kinds and methods of maintaining rangeland developments, livestock handling procedures, and supplemental feeding and salting practices.

Calving generally takes place from March through May. Calves weigh between 120 and 200 lbs. when they are taken to summer ranges. When cattle are removed from summer ranges around October, calves are weaned and sold at weights between 350 and 400 lbs.

Lambing occurs in April and May. The lambs are usually cut out of the band and sold in October or November after being raised mostly on non-BLM lands and land outside the planning area. At this time they usually weigh between 75 and 85 lbs.

# SOCIOECONOMICS

The majority of livestock permittees live in Wayne County. However, because of existing geographic and economic interrelationships, the economic impact area analyzed will include Wayne, Sevier, and Garfield Counties, all in Utah.

The people of Wayne and Garfield Counties are economically dependent upon having access to and using the natural resources in and near the planning area. The livestock industry and the production of livestock forage on public lands has traditionally been a major element in their economy. Many livestock permittees work at other jobs, however, and livestock operations are not always their primary source of income.

Sevier County, while still rural in nature, has a more diverse economic base and serves as a service center for Wayne and Garfield Counties.

The population of these three counties increased from 14,743 people in 1970 to 20,311 people in 1980. This represents a 38-percent increase or an annual growth rate of 3.26 percent. During this same time, the State of Utah population increased by 38 percent, an annual growth rate of 3.3 percent. Thus, in comparison, these counties grew at rates comparable to the State average (U.S. Department of Commerce [USDC], Bureau of the Census, 1981b).

From 1970 through 1980, total non-agricultural employment increased by 66 percent in Wayne County and 200 percent in Garfield County, for annual growth rates of 5.2 and 7.18 percent, respectively. In Sevier County, the increase was 80 percent or an annual rate of 6.1 percent (Utah Department of Employment Security, 1982). The farm sector in all three counties had a decrease in employment of between 5 and 6 percent for the period from 1974-79 (USDC, 1981a).

In 1978, the value of livestock and livestock products sold in Wayne, Garfield, and Sevier Counties was $2,971,000, $2,869,000, and $23,538,000, respectively. The total in the three-county area was $29,378,000, which accounted for 85 percent of the total agricultural products sold (USDC, Bureau of the Census, 1981c).

## Sales From Big Game Hunting

It is estimated that bison hunters spend about $206.00/day and that other big game (deer) hunters spend about $47.00/day (USDI, BLM, 1982). At those rates, the estimated 108 bison hunter days and 208 deer hunter days in 1980 generated about $32,024 of sales in the planning area ($22,248 for bison and $9,776 for deer).

## Ranch-Related Economic Conditions

Cattle ranching operations were divided into small, medium, and large categories. Average ranch budgets were then developed for each size. (While there are four permittees holding sheep permits, most of them have not used their permits during the past 5 years; therefore, no analysis is made for sheep ranches.) These budgets, displayed in Table 3-14, show the revenues and expenses for the "average ranch" within each category and provide baseline data for subsequent calculations. The assumption inherent in this approach is that individual operations within any one category are sufficiently represented; therefore, any conclusions applied to the "average ranch" would also apply to the majority of its individual operations. It should be noted, however, that wide differences may occur among individual operations. Detailed ranch budgets from these categories are presented in Appendix 3. (Data used in describing and analyzing ranch budgets is from Jacobson [1981] unless otherwise cited.)

TABLE 3-14

Partial Budgets for Each Category of Ranch Permittee

| | Categories | | |
|---|---|---|---|
| | Small (1 to 100 cows) | Medium (101 to 200 cows) | Large (201+ cows) |
| Average Herd Size | 90 | 160 | 430 |
| Gross Ranch Income | $30,240 | $50,772 | $141,616 |
| Total Cash Costs | 21,111 | 37,470 | 90,585 |
| Net Cast Income | 9,129 | 13,302 | 51,031 |
| Net Ranch Income | 6,482 | 8,689 | 42,566 |
| Return to Land Investment | -1,645 | -5,466 | 8,288 |
| Return to Operator | -14,090 | -21,402 | -35,032 |

Source: Appendix 3.

## SMALL CATTLE OPERATIONS

About 48 percent of the livestock permittees are in the small-size (1-100 animals) category. The budgets for these ranches show an average of 90 cows. These permittees also graze livestock on other public lands (National Forest, State, or other BLM lands) and on owned or rented private lands.

Table 3-14 includes data for an average small-scale ranch budget. The permittee's net ranch income is $72.00 per cow. Typically, these ranchers supplement this income with an off-ranch job.

## MEDIUM CATTLE OPERATIONS

About 23 percent of the livestock permittees operate medium-sized ranches. Ranchers in the medium scale run from 101 to 200 cows and average 160 head. In addition, medium-sized operations also obtain forage from private and other public lands. These permittees have an average annual net ranch income of $54.00 per head (see Table 3-14). Some of these permittees also supplement ranch income with off-farm labor by one or more members of the family.

## LARGE CATTLE OPERATIONS

Approximately 21 percent of the permittees are in the large category (200 or more head). The average large-scale ranch has 430 cows. As with the other size categories, the large cattle operations also depend on other BLM, National Forest, State, and private lands for forage during the year.

Table 3-14 includes data on the large-scale average ranch budget. Large cattle operations are typically more capable of diversifying to meet changing market conditions and are more likely to be operated by full-time ranchers. Their per head ranch income is estimated at $99.00.

## ANNUAL RETURNS

The factors which affect a livestock permittee's ranch income are: (1) price per unit weight at sale; (2) weight per animal; (3) number of animals; and (4) costs of raising the animal to marketability. BLM management has the potential of affecting all but the price per unit weight.

## CAPITAL VALUES

Active preference AUMs can affect the overall capital value of ranch property. Any change in permitted use has the potential of affecting the livestock permittee's ability to secure a loan and the overall capital value of his property.

BLM AUMs may be transferred from one permittee to another. The dollar value given by one permittee (buyer) to induce a present permit holder (seller) to transfer his permit is known as the "permit value" of an AUM. This "permit value" may have a significant bearing on the permittee's wealth position. The current permit value of an AUM is estimated at about $20.00 per AUM (Bagley, 1982).

## Attitudes and Lifestyles

Many livestock operations on the planning area have been traditionalized over several generations. However, most permittees do not live in the planning area. Working in outdoor employment and directly interfacing with the region's natural resources are important lifestyle aspects. As a consequence, livestock permittees regard the region as a good place to live and raise a family and, generally, would not consider relocating to another area for alternative employment. For the most part, they feel that multiple-use management by the BLM is at least satisfactory (DePaepe, 1981).

Mining is another important area employment opportunity. Livestock permittees and miners tend to be oriented only toward their respective resource. Livestock permittees generally do not favor big game and believe herd sizes, particularly bison, should be reduced. Miners usually regard big game as an important recreational resource and would like to see numbers increased (Edmonds and DePaepe, 1981).

Conservation groups generally accept livestock grazing, under proper management, as a compatible planning area land use. However, conservation groups believe that priority forage use should be made for bison, bighorn sheep, and antelope. In addition, they consider the planning area as having high national significance because of the outstanding scenic and recreational values (USDI, BLM, 1981a).

## Human Health and Safety

BLM liability for damages resulting from livestock grazing along Utah Highways U-24, U-95, and U-276 was identified as a possible issue. BLM is not liable for domestic livestock vehicle collisons along the above-referenced highways (Utah Highway Patrol, 1981). Under the law, the driver is responsible in the event of any vehicle-domestic livestock collisions in "open range" areas. Because these highways are classified as open range, BLM would be liable only when a BLM vehicle struck an animal.

Reported accidents along these highways during recent years show one animal killed on U-24; no animal-vehicle collisions on U-95; two killed along U-276 between Bullfrog and the junction with U-95; two killed in 1978; one killed in 1979; and one killed in 1980. There were some injuries but no fatalities from these accidents.

# CHAPTER 4

# ENVIRONMENTAL CONSEQUENCES

## BASIC ASSUMPTIONS AND ANALYSIS GUIDELINES

This chapter analyzes how the alternatives described in Chapter 2 would impact the existing environment discussed in Chapter 3. The documentation in this chapter substantiates conclusions reached in the impact analyses. This discussion is arranged so that adverse and beneficial effects of each alternative can be compared by resource.

This chapter also analyzes how each alternative would affect the resources identified in Chapter 3, followed by a conclusion of how each alternative would affect the rangeland ecosystem and the animals and people that rely on it.

It is assumed that the amount of forage use proposed under each alternative would be used entirely by the animal to which it is assigned. Livestock herd size would be adjusted to forage use levels and big game would reach their proposed forage use levels.

The following terms are used in describing impacts expected from the alternatives:

*Short Term.* Impacts which would last for not more than 5 years.

*Long Term.* Impacts which would last 20 years or more.

*Irreversible.* A permanent commitment of resources; an action that, once taken, would cause a permanent change. A return to the current situation would be impossible or technically or economically unfeasible.

*Irretrievable.* A permanent loss of resources that would be impossible or technically or economically unfeasible to replace.

The unavoidable adverse and beneficial impacts, short-term use and maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitment of resources are discussed throughout this chapter. This discussion is organized by resource and alternative. Table 2-5, located at the end of Chapter 2, presents this information in a summary form.

## RESOURCES NOT ANALYZED

Certain resources would not be affected by the actions analyzed in this environmental impact statement (EIS). Also, none of the actions proposed in the alternatives would violate laws or established policy, assuming that the standard measures outlined in Chapter 2 were adhered to. Therefore, the following resources are not included in impact analysis.

### Cultural Resources (Archaeology, History, and Paleontology)

The Bureau of Land Management (BLM) has entered into a Memorandum of Understanding with the Utah State Historic Preservation Officer outlining compliance with the National Historic Preservation Act. Even with the implementation of proposed mitigation, ground-disturbing actions (i.e., construction of rangeland improvements) could inadvertently damage or destroy cultural resources, resulting in a loss of scientific and educational information.

Any destruction of cultural remains during land treatment would result in a long-term loss of scientific and educational information since present salvage techniques do not ensure total information recovery. This adverse impact is irreversible; the information lost by that impact is irretrievable. However, the intensive cultural resource inventory required prior to any ground-disturbing action would be a beneficial impact to our knowledge of cultural resources because it would result in the documentation of previously unknown sites and areas.

### Threatened, Endangered, and Sensitive Species

Because of Standard Measure No. 5 included in Chapter 2 (Grazing Administration section), no impact is expected to occur to any threatened, endangered, and sensitive animal or plant species.

### Geology

No actions analyzed in this EIS would impact geology, including minerals, oil, and gas.

### Land Use Plans and Controls

All actions analyzed in this EIS are in compliance with the land use plans and controls of other agencies having jurisdiction in or near the planning area.

### Air Quality

No action analyzed in this EIS would impact air quality.

## VEGETATION

The vegetation production data displayed and used in this EIS was collected during the 1978-1980 field seasons, using accepted BLM methods. This data was needed to help determine areas suitable for continued livestock grazing and to provide the basis for developing a rangeland management program and management alternatives. The vegetation production data has also been used to identify and analyze impacts and mitigation of the proposed action and alternatives. Reviewers of this EIS, however, should recognize the limitations of vegetation inventory data. While this data is adequate for purposes of planning and analysis, it must be supported by the results of monitoring studies before making forage allocation decisions.

However, impacts to vegetation resulting from different alternative levels of grazing can be identified and are analyzed for each allotment in this EIS, using the soil-vegetation inventory, along with licensed use, ecological condition, and more than 10 years of trend and utilization studies (see Table 3-3).

Natural potential vegetation is the result of climate and soils. The ecological condition, trend, and forage production that is described in Chapter 3 are a result of past and current grazing and fire control. Allotment level analysis of the inventory and study data indicates that current grazing use exceeds total grazing capacity on seven allotments (see Table 4-1) and that the period, pattern, or distribution of grazing use is a problem on portions of five other allotments.

It has been shown that, where use by livestock and big game exceeds grazing capacity, vegetation overutilization occurs. It is well documented that utilization averaging greater than 50 percent on an annual basis, especially during critical periods of plant growth and reproduction, weakens and eventually destroys most native rangeland plants. This is because of losses of carbohydrate reserves (Stoddart et al., 1975; McIlvanie, 1942), losses of live root mass (Cook, 1966), and reduction of plant vigor as measured by herbage weight and seed stalk production (Mueggler, 1975).

Period of use can also be a problem for rangeland plants. Studies conducted in western Utah on rangelands similar to those in the Henry Mountain Planning Area have shown that there is a relationship between period of use and intensity of harvesting (Cook, 1971). These studies found, without exception, that excessive spring grazing reduced twig length in browse and the number of seed stalks in grasses and caused a larger portion of the plants to die in each species. In general, too heavy, too early, and too frequent removal of herbage results in a marked decline in the vigor of rangeland plants.

Usually the most productive and palatable plants and those most sensitive to grazing are the first to be reduced in a plant community. As the population of a certain plant species is reduced, ecological condition is adversely affected and trend turns downward.

Trend studies indicate change by monitoring key plant species in a rangeland site over time. Of the 127 trend plots in the planning area, 23 show a downward trend and 16 are static on poor condition rangeland (see Appendix 2). This indicates that, after considering precipitation, grazing use may be a problem. Conversely, there are 44 plots on which the long-time estimate of trend is upward or static on good condition rangeland. This indicates the likelihood of insignificant or no grazing use problems over the study period.

TABLE 4-1

Comparison of Grazing Use to Forage Production[a]

| Allotments | Alternative A | | | | Alternative B | | | |
|---|---|---|---|---|---|---|---|---|
| | Average Licensed Livestock Use Exceeds Grazing Capacity | Percent of Grazing Capacity Used | Big Game Use Exceeds Grazing Capacity[b] | Percent of Grazing Capacity Used | Livestock Use at Preference Would Exceed Grazing Capacity | Percent of Grazing Capacity Used | Big Game Use at Full Big Game Reservation Would Exceed Grazing Capacity | Percent of Grazing Capacity Used |
| Blue Bench | No | -- | Yes (B)[c] | 160 | Yes | 167 | Yes (B) | 320 |
| Bullfrog[d] | No | -- | Yes (B) | 131 | Yes | 134 | No | -- |
| Burr Point[d] | No | -- | Yes (D)[e] | 109 | Yes | 114 | Yes (D) | 203 |
| Cathedral | No | -- | No | -- | Yes | 134 | No | -- |
| Cedar Point | No | -- | Yes (B) | 188 | Yes | 146 | Yes (B) | 125 |
| Crescent Creek | Yes | 185 | No | -- | Yes | 183 | No | -- |
| Hanksville[d] | No | -- | No | -- | No | -- | No | -- |
| Hartnet | No | -- | No | -- | Yes | 106 | No | -- |
| Nasty Flat | Yes | 147 | Yes (D) | 103 | Yes | 160 | Yes (D) | 248 |
| North Bench | No | -- | No | -- | Yes | 149 | No | -- |
| Pennell[d] | No | -- | Yes (B) | 101 | Yes | 110 | No | -- |
| Robbers Roost[d] | No | -- | No | -- | No | -- | No | -- |
| Rockies[d] | No | -- | Yes (D) | 109 | Yes | 129 | Yes (D) | 136 |
| Sandy 1[d] | Yes | 109 | No | -- | Yes | 139 | No | -- |
| Sandy 2 | Yes | 211 | Yes (B) | 127 | Yes | 312 | Yes (B) | 107 |
| Sandy 3 | No | -- | No | -- | Yes | 101 | No | -- |
| Sawmill Basin | No | -- | No | -- | Yes | 259 | No | -- |
| Sewing Machine | No | -- | No | -- | No | -- | No | -- |
| Steele Butte | Yes | 109 | Yes (B) | 143 | Yes | 267 | Yes (B) | 126 |
| Trachyte[d] | Yes | 101 | No | -- | Yes | 180 | No | -- |
| Waterpocket[d] | No | -- | No | -- | No | -- | No | -- |
| Wild Horse | No | -- | No | -- | No | -- | No | -- |
| Unallotted Areas | | | | | | | | |
| Dry Lakes | -- | -- | Yes (B) | 226 | -- | -- | Yes (B) | 190 |
| Flint Trail | -- | -- | No | -- | -- | -- | No | -- |
| Little Rockies | -- | -- | No | -- | -- | -- | No | -- |
| North Caineville Mesa | -- | -- | No | -- | -- | -- | No | -- |
| South Caineville Mesa | -- | -- | No | -- | -- | -- | No | -- |

[a] See Table 2-2, Alternative A, for numbers of livestock and big game involved.

[b] Estimated big game use exceeds grazing capacity based on optimum big game diets. The acreage involved is limited, see Tables 3-6 and 3-8.

[c] (B) = Bison use.

[d] To determine if overutilization is occurring or would occur, total cattle use was added to total sheep use and compared to the total of both sheep and cattle forage. There are differences in competitive forage between sheep and cattle from allotment to allotment which are caused by differences in plant composition. See footnotes g and h on Table 2-2, Alternative E for explanation of specific situations on common use (sheep and cattle) allotments.

[e] (D) = Deer use.

If trend is sustained in one direction over a long period of time, the condition class of a range site can change. Therefore, trend studies are reflective of a gradual change in condition class.

It can be concluded that, with no change in the level, pattern, or period of livestock use or distribution, trend would continue in the direction shown in Appendix 2. On range sites where the trend is down, the next lower condition class would be reached. There would be no change in condition class on sites where trend is static. There would be improvement to the next higher condition class for range sites with an upward trend. The time period involved in a change from one condition class to another would be different for each range site. A change to a lower condition class would be marked by fewer desirable plant species and reduced diversity and forage production. Maintaining a range site in a lowered condition class can contribute to increased erosion and has the potential for permanently lowering the production potential.

## Alternative A: Proposed Action—No Change

The adverse impacts of Alternative A can be summarized as follows:

1. Overutilization would continue on seven allotments. See Table 4-1 for allotment and percent of overutilization.

2. The period, distribution, or pattern of use would continue to cause overutilization on portions of Burr Point, Cedar Point, Hartnet, Pennell, and Hanksville Allotments.

3. A downward or static trend on poor condition rangeland would continue on 39 of 127 trend plots, affecting 13 allotments.

This alternative has the potential for adversely affecting forage production and ecological condition on 18 percent of the public land in the planning area.

## Alternative B: No Action

The level of use under this alternative would more than double from current use (27,646 animal unit months [AUMs]) to 62,721 AUMs (active preference plus big game reservations), an increase of 127 percent. Allotment analysis shows that grazing use would exceed forage production on 18 allotments. With an increase in grazing, problems with the livestock and bison period or pattern of use or distribution would intensify and cause heavy or severe utilization on portions of four other allotments. As discussed in Alternative A, plant species which contribute most to forage production would respond adversely to overutilization and increased use during early spring and continue through early summer. These are periods critical to plant growth and reproduction.

It is expected that trend studies would show an increase in undesirable plant species and a decrease in desirable plant species. The key plant species that are used in the trend studies are shown in Appendix 2.

Because of the distribution of trend study plots, it is not possible to accurately predict how each plot would respond. However, a worst-case analysis indicates that 36 of 38 improving plots would become static and 63 of 65 static plots would begin to show a downward trend within an estimated 5 years. Sustaining the level of use proposed by this alternative would cause an eventual reduction in the current ecological condition as shown in Table 3-3. As stated previously, maintaining a range site in a lowered condition class can permanently lower its production potential.

The adverse impacts to vegetation under Alternative B can be summarized as follows:

1. Overutilization would occur on 18 allotments. (See Table 4-1 for name of allotments and percent of overutilization.)

2. Heavy or severe utilization of forage plant species would occur because of livestock or bison period, distribution, or pattern of use on portions of Hanksville, Robbers Roost, Waterpocket, and Wild Horse Allotments.

3. Trend would turn from improving to static and from static to down on all or portions of the allotments shown in Table 4-1.

This alternative could adversely affect forage production and rangeland condition on 56 percent of the public and National Recreation Area (NRA) lands in the planning area.

## Alternatives C, D, and E

The impacts to vegetation under Alternatives C, D, and E would be the same for most allotments. The level of livestock grazing use would be adjusted to each allotment's forage production capacity as determined by the soil-vegetation inventory and monitoring studies. Allotment analysis indicates that overutilization would continue on some areas primarily because of the bison or livestock period or pattern of use or distribution. However, rangeland improvements have been specifically designed for each alternative to help remedy such overutilization. In addition, allotment management plans (AMPs) will be written in consultation with permittees outlining the use of rangeland improvements and any changes in livestock grazing use.

The identifiable impacts to vegetation from Alternatives C, D, and E are analyzed below.

1. Alternative C: Optimize Big Game: In the short term, bison use would continue to exceed grazing capacity on the Dry Lakes Allotment (see Table 4-1). In addition, overutilizaton would continue because of the period or pattern of use or distribution of livestock on portions of Burr Point, Cedar Point, Sandy 2, Hanksville, and Hartnet Allotments.

2. Alternative D: Optimize Livestock: Use would not exceed grazing capacity on any allotment. In the short term, overutilization would continue because of the period or pattern of use or distribution of livestock on portions of Burr Point, Cedar Point, Nasty Flat, Hanksville, Hartnet, and Pennell Allotments.

3. Alternative E: Preferred Alternative—Planning Recommendation: In the short term, bison use would continue to exceed grazing capacity on the Dry Lakes Allotment. In addition, overutilization would continue because of the period or pattern of use or distribution of livestock and bison on portions of Burr Point, Cedar Point, Nasty Flat, Sandy 2, Hanksville, Hartnet, Pennell, and Steele Butte Allotments.

Overutilization occurring under Alternatives C, D, or E would be short term because the rangeland improvements shown in Table 2-4 are designed specifically to: (1) increase forage production or improve forage quality; (2) adjust the livestock period or pattern of use to enhance forage production; and (3) correct distribution problems. Overutilization would last from the time the alternative was implemented until the rangeland improvement became established. From experience with other management plans and EISs, this would be from 2 to 5 years. During this period of time, it is expected there would be little or no change in trend, rangeland condition, or forage production.

In the long term, after full implementation of either Alternative C, D, or E, grazing use would generally not exceed grazing capacity on any allotment. However, because of the nature of grazing animals, isolated areas of overutilization would probably still exist, especially along riparian zones and around reservoirs. It is expected that trend would show improvement over the entire planning area and ecological condition would improve. The amount of improvement cannot be quantified with available data.

## RANGELAND IMPROVEMENTS

Rangeland improvements are proposed for Alternatives C, D, and E. Proposed improvements are the same for these three alternatives. However, the land treatment proposed on Dry Lakes Allotment under Alternative D is primarily to benefit big game animals. It could, however, benefit livestock grazing indirectly by providing more forage for bison and thus relieving grazing pressure on Nasty Flat Allotment.

Table 2-4 lists proposed rangeland improvements and grazing management practices for each allotment and unallotted areas. Table 4-2 summarizes the data provided in Table 2-4 in acreages for the planning area.

Five general proposals are made for changes in grazing management: (1) continue present grazing system; (2) implement a new grazing system; (3) implement season-long grazing; (4) continue season-long grazing; and (5) allow no grazing.

*1. Continue Present Grazing System.* Some form of grazing system based on rotation and deferred use or rest-rotation of two or more management units (pastures) is presently being followed on ten allotments under an AMP or management agreement. These allotments are responding favorably to the grazing system and rangeland improvements (e.g., development of water sources).

*2. Implement a Grazing System.* Favorable conditions exist on seven allotments for the development of a grazing system that would increase forage production. Some rangeland developments (i.e., additional water developments and fences) could be required before implementation.

*3. and 4. Implement New Grazing System/Continue Season-long Grazing.* It is proposed to continue season-long grazing on four allotments and to implement season-long grazing on one allotment. There are presently no practical means for dividing these allotments into management units (pastures).

*5. No Grazing.* No livestock grazing is scheduled for five unallotted areas, except under Alternative D. Some of these areas are unsuited to livestock grazing because of lack of access or dependable water supplies, steep slopes, or values of the areas for other resources. Although Flint Trail Allotment has no grazing scheduled, it could be used on a temporary, as-needed basis for livestock grazing while other allotments were being rehabilitated or in an emergency situation.

### *Land Treatments*

Specific land treatments have not been identified for each site because it is not known at this time what constraints will be placed on the treatment measures prescribed. Identified sites have the potential to respond favorably to any number of treatments including chain and seed, plow and seed, contour furrow or trench and seed, burn and seed, burn only, spray, and interseed with browse and/or forbs. Factors such as soils, climate, topography, existing vegetation, and

TABLE 4-2

Proposed Rangeland Improvements and Grazing Management Practices Under Alternatives C, D, and E

| Practices | Grazing Management<br>Number of Allotments |
|---|---|
| 1. Continue Present Grazing System | 10 |
| 2. Implement a Grazing System | 7 |
| 3. Continue Season-long Grazing | 4 |
| 4. Implement Season-long Grazing | 1 |
| 5. No Livestock Grazing | 5 |

| Alternative | Land Treatments<br>Number of Allotments | Acres | Livestock AUMs | Big Game AUMs | Total AUMs |
|---|---|---|---|---|---|
| Alternative C | 10 | 23,950 | 418 | 2,577 | 2,995 |
| Alternative D | 9 | 23,950 | 2,835 | 160 | 2,995 |
| Alternative E | 10 | 23,950 | 2,435 | 560 | 2,995 |

| Type | Rangeland Developments<br>Number of Allotments | Units |
|---|---|---|
| Springs | | |
| Redevelop | 3 | 3 |
| New | 10 | 15 |
| Reservoir | | |
| Recondition | 18 | 59 |
| New | 17 | 60 |
| Pipelines (miles) | 7 | 31 |
| Troughs | 14 | 41 |
| Wells | | |
| Vertical | 3 | 6 |
| Horizontal | 1 | 2 |
| Corrals | 1 | 1 |
| Fences (miles) | 5 | 16 |
| Cattle Guards | 2 | 2 |

Source: USDI, BLM, 1982.

current big game use have been evaluated to determine the potential of the sites for increased production of forage, increased ground cover for soil protection, and improved plant composition (condition).

Each site was evaluated for probability of success. Only sites having 50 to 70 percent or more chance for success were considered. The following criteria were used to determine sites within each allotment where land treatment should be proposed:

1. Need for measures that would reverse downward trend in rangeland condition within an acceptable period of time (e.g., 5 years on sensitive sites).

2. Need to improve ecological condition and site productivity to an acceptable level within a reasonable period of time (e.g., 15 to 20 years) if grazing management alone would not meet this level.

3. Suitability of the site for grazing livestock and/or for big game habitat based on suitability criteria.

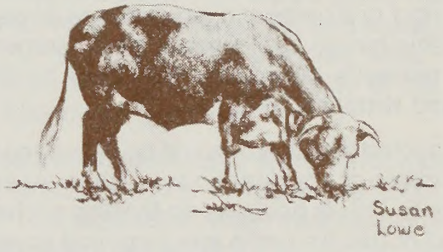
4. Soil suitability in areas receiving land treatment. Soils should be deep, low in soluble salts, and possess physical properties (texture and structure) favorable to soil moisture storage. Effective root depths of 16 inches or more are desirable (Robinson, 1979). Soils with soluble salts in excess of 1 percent (particularly sodium) are not suitable for restoration measures. Treatment of rocky soils and landscapes may be limited to burning or spraying with selective herbicides (Plummer et al., 1968).

5. Suitability of the slopes to sustain vegetation modification in areas receiving land treatment. Slopes of less than 20 percent are generally best suited for restoration treatment. Slopes of up to 50 percent can be chained and burned with care. Slopes exceeding 50 percent are not considered for treatment except for stabilizing soils and reducing runoff (Plummer et al., 1968; Vallentine, 1974).

6. Availability of soil moisture for vegetation modification. Precipitation in excess of 9 inches is generally essential for successful treatments. Crested wheatgrass and Russian wildrye can be successfully seeded where the annual precipitation exceeds 10 inches; such species as intermediate wheatgrass require in excess of 13 inches (Plummer et al., 1968; Vallentine, 1974). Alfalfa and other forbs, as well as desirable shrubs, may be seeded or interseeded with grass where rainfall is 12 to 15 inches or more (Plummer et al., 1968).

7. Needs of grazing animals (e.g., seeding to furnish early spring grasses for livestock or to produce more desirable browse and forbs for wintering big game and/or livestock, etc.) (Cook and Harris, 1968; Frischknecht and Stevens, 1979).

The kind of land treatment to be proposed depends on the current vegetation and soil conditions. Spraying and burning may be proposed to control sagebrush where there are at least one desirable shrub and ten desirable forbs per 100 square feet and at least one key grass plant encountered each one or two paces across the site (Plummer et al., 1968). Burning also requires sufficient plant material to carry a fire; however, if the area is critical to animal life, this method is not acceptable. Where insufficient desirable plant cover occurs, seeding would be required. In addition to useable grasses, various mixtures of shrubs and forbs should be planted (Frischknecht and Stevens, 1979). The method of seedbed preparation could vary depending on the cover type of the site. Chaining is the most useful in controlling a pinyon-juniper area, while both plowing and chaining can control sagebrush and leave a desirable seedbed.




If plant cover is low and excessive on-site runoff and erosion are occurring, contour furrowing and structures such as gully plugs are required to establish a desirable vegetation community (Robinson, 1979).

Standard design features applicable to land treatments are available in various publications (Plummer et al., 1968; Vallentine, 1974).

Water developments, fencing, stock trails, and other supporting rangeland developments would be installed on allotments to be used in combination with land treatment and other management tools to improve rangeland conditions, protect important habitat areas, and correct existing rangeland problems.

Under Alternative D, nine allotments (22,650 acres) would be treated, making 2,835 AUMs available for livestock. In addition, 3,000 acres of existing grass seedings would be interseeded with forbs, making 400 additional AUMs available to livestock. The additional forage from the interseeding of desirable forbs would also improve the forage quality for big game. An additional 1,300 acres in Dry Lakes would be treated to make 160 AUMs available for big game.

Under Alternatives C and E, 23,950 acres on ten allotments would be treated to increase the grazing capacity by an estimated 2,995 AUMs (see Table 4-2). Under Alternative C, the additional 2,577 AUMs would be provided to big game and 418 AUMs to livestock. Under Alternative E, 2,435 AUMs would be provided to livestock and 560 AUMs to big game.

Because no rangeland improvements or changes in grazing management are proposed for Alternatives A and B, no impacts would be expected.

### *Riparian Zones*

Much of the current poor condition of riparian zones is the result of past overgrazing of watersheds, road building, mining, and early farming practices. Currently, cattle cause most of the grazing-related impacts.

Several factors cause cattle to concentrate in riparian zones, especially in the spring and early summer. These include availability of desirable forage, limitations on livestock movement imposed by steep slopes, and erratic distribution of watering areas away from streamsides. Therefore, vegetation in riparian areas is much more heavily utilized than that of surrounding upland areas. Studies have shown that a riparian zone constituting 1 or 2 percent of an area and 21 percent of the available forage can account for 81 percent of the total herbaceous vegetation removed by livestock (Roath and Krueger, 1982).

It is expected that there would be little or no change in the condition of any riparian zone under Alternatives A, B, D, or E. This is because no fencing or changes in the period of use for cattle are proposed to protect or change the pattern of use in riparian areas. Under Alternative C, livestock grazing would be eliminated from Crescent Creek, Nasty Flat, Pennell, and Sawmill Basin Allotments. These are all bison use areas; however, bison do not concentrate in riparian zones to the extent that cattle do. Therefore, improvement in the condition of riparian zones on these allotments could be anticipated under Alternative C.

## Conclusion

Forage production and ecological condition would be adversely affected by vegetation overutilization on 18 percent of the area under Alternative A and on 56 percent of the area under Alternative B.

Under Alternatives C, D, and E, trend in ecological condition would remain static or go up slightly in the short term. While short-term overutilization would occur in localized areas, this would not cause any detectable adverse impacts. In the long term, a corresponding increase in ground cover, improved vigor in key forage plants, and an increase in the percent composition of the more desirable plant species would occur. No increase in grazing capacity would be expected in the short term. Small increases could be expected over the long term. There would be long-term improvement in ecological condition and increases in forage production under Alternatives C, D, and E.

Land treatment measures, primarily chaining and seeding and/or burning and seeding, could be expected to show more dramatic results in both the short and long terms. The productivity of rangeland forage could be expected to increase as much as 10 times in pinyon-juniper, sagebrush, and Gambels oak areas. Ground cover would be disturbed during the early implementation stages (1-2 years), and grazing capacity for livestock would be lost during the years required for rest. This is especially true following burning. Within 3 years, however, ground cover would be more widely dispersed and equal to or exceeding that prior to treatment.

Additional AUMs from land treatments on ten allotments totaling 23,950 acres would be added in the long term. Increases in AUMs would be divided as follows:

Alternative C. 418 for livestock and 2,577 for big game, totaling 2,995 AUMs.

Alternative D. 2,835 for livestock and 160 for big game, totaling 2,995 AUMs.

Alternative E. 2,435 for livestock and 560 for big game, totaling 2,995 AUMS.

In the long term, forage production would gradually decrease as invading pinyon-juniper and brush replaced desirable seeded species. At this time it would be necessary to burn or chain the areas again.

(Standard) Crested wheatgrass (L)
(Fairway) Crested wheatgrass (R)

# SOILS

## Erosion

### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

Anticipated impacts on soils would be caused by changes in ground cover and soil surface disturbance. Studies indicate that heavy grazing has an impact on erosion and sediment yield (Gifford, 1975). As vegetation ground cover decreased, erosion would generally increase. This would occur on portions of 12 allotments where grazing capacity was exceeded (see Table 4-1 and the Vegetation section, Chapter 4). Table 3-5 shows the present erosion condition of all allotments. Some of the current erosion condition is caused by the geologic or inherent nature of the soil to erode and is not affected by grazing of livestock or big game.

### ALTERNATIVE B: NO ACTION

Impacts to soils would be similar to those described in Alternative A. Increased erosion would occur on portions of 22 allotments where grazing capacity would be exceeded (see Table 4-1 and the Vegetation section of this chapter).

### ALTERNATIVE C: OPTIMIZE BIG GAME

Severe overgrazing must generally occur before significant changes in erosion can be observed (Smeins, 1975). In this alternative, grazing capacity would not be exceeded; therefore, any increase in erosion caused by grazing would be minimal.

Land treatments are proposed on ten allotments, totaling 23,950 acres (see Table 2-4). This would result in a temporary increase in erosion from surface disturbance. Studies in southern Utah found that chaining treatments where debris was left in place did not increase sediment yield (Buckhouse and Gifford, 1976). Planned burning in the sagebrush-grass areas of the intermountain area where soils are fairly firm and the slopes less than 30 percent show slight soil losses, and soil movement has been arrested almost completely by the end of the first spring (Vallentine, 1974). Therefore, no significant increase in erosion is expected. In the long term, erosion would be further reduced as vegetation became reestablished on the 23,950 acres receiving land treatments.

### ALTERNATIVE D: OPTIMIZE LIVESTOCK

Impacts to soils in this alternative would be the same as discussed in Alternative C.

### ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

Impacts to soils in this alternative would be the same as discussed in Alternative C.

## Conclusion

The proposed land treatments on 23,950 acres for Alternatives C, D, and E would result in a beneficial impact to the soils resource because increased vegetation cover would decrease erosion. Alternative A would result in increased erosion on about 18 percent of the planning area where overgrazing occurred. Alternative B would result in adverse impacts to soils where overgrazing would contribute to increased erosion on about 56 percent of the planning area.

# WATER RESOURCES

## Alternative A: Proposed Action—No Change

Impacts to the water resource interrelate closely with soils. Where surface disturbance and reduced vegetation occurs, soil erosion rates and sediment yield are affected which, in turn, affect water quality and yield.

Grazing capacity would be exceeded on portions of 12 allotments (see Table 4-1 and the Vegetation section of this chapter). This would leave more soil exposed to higher sediment yield and surface runoff on about 18 percent of the planning area. Some deterioration of surface water quality in the vicinity of these allotments would occur.

Numerous studies have shown that moderate and heavy grazing results in increased runoff (Smeins, 1975). This increase in water yield would be expected in the steeper mountain portions. No significant impact on water yield from the drier portion would be expected. A study conducted in the planning area by Guisti (1977) found that increased runoff resulting from soil disturbance during construction dissipated a short distance from the site.

## Alternative B: No Action

Impacts to the water resource would be as described in Alternative A, except portions of 22 allotments would be affected where grazing capacity was exceeded (see Table 4-1 and the Vegetation section of this chapter). Sediment yield would increase on about 56 percent of the planning area, decreasing surface water quality from overland flow.

## Alternative C: Optimize Big Game

There would be a short-term, localized decrease to surface water quality from disturbance caused by land treatments on ten allotments (see Table 2-4). In the long term, sediment yield would decrease as vegetation became reestablished. Water quality would improve and surface runoff would be reduced on ten allotments (23,950 acres).

### Alternative D: Optimize Livestock

Impacts to the water resource would be similar to those described in Alternative C.

### Alternative E: Preferred Alternative—Planning Recommendation

Impacts to the water resource would be similar to those discussed in Alternative C.

### Conclusion

Alternatives C, D, and E would result in a beneficial impact to water resources because land treatments on 23,950 acres would increase vegetation cover, thereby decreasing sediment yield and improving surface water quality. Alternatives A and B would cause a decrease in surface water quality as sediment yield increased on portions of 12 and 22 allotments, respectively. This would result from decreased vegetation cover caused by overgrazing.

## ANIMAL LIFE

### Deer

Mule deer numbers on the Henry Mountains have been at a low, static condition for the past 15 years. Productivity data shows that this herd unit is one of the lowest in the State of Utah. Preseason classification data shows that the 10-year average for this herd is only 61 fawns/100 does as compared to a state average of 77 fawns/100 does (Utah Division of Wildlife Resources [UDWR], 1981a). In an attempt to determine those factors influencing deer productivity on the Henry Mountains, Pederson and Harper (1978) conducted a study comparing this herd unit with the highly productive LaSal Mountain unit. Of all the factors studied (i.e., disease, parasites, harvest rates, predation, and rangeland condition), only summer range condition differed significantly between the two mountain areas. Data showed that forage on the LaSal summer ranges was composed of over 50 percent forbs whereas forbs made up only 12 percent of the forage on comparable ranges in the Henrys. In addition, summer ranges on the LaSal Mountains produced 7 times more forb biomass: 1,117 kilograms per hectare (kg/ha) of fresh weight forbs as compared to 158 kg/ha on Henry Mountain summer ranges. Because forbs are an important source of crude protein, the authors speculated that "the shrub-dominated forage of the Henry Mountain summer ranges may be deficient in protein." The authors concluded that: "The characteristics of the forage found on the summer range, especially the quantity and quality of forbs, exert important influences on the productivity of these herds." (Pederson and Harper, 1978). Other reasons for decline in deer numbers were associated with road construction (access) and heavy hunting pressures.

The importance of forbs in a deer's summer diet has been reported (Kufeld et al., 1973). Because forbs are easily digested and high in crude protein content and other important nutrients (Cook, 1972; Harner and Harper, 1973; and Pieper and Beck, 1980), they contribute significantly to the nutritional status of deer during the summer, especially to fawns and lactating does. Therefore, because of Pederson's and Harper's (1978) earlier work and because the literature clearly shows that good summer range greatly influences such productivity factors as breeding success (Julander et al., 1961), fetus and ovulation production rates (Longhurst et al., 1952; Julander et al., 1961), fawn survival (Yoakum, 1965), the ability of lactating does to produce milk (Verme, 1962), and growth rates and body size (Severinghaus and Cheatum, 1956; Swank, 1958), an analysis of mule deer summer diets was conducted, based on the soil-vegetation inventory.

This analysis showed that, to meet the proposed deer AUM requirements for each alternative, diets containing an average of 90 percent shrubs had to be provided. This percentage of browse species in a deer's summer diet is considerably higher than that reported in the literature (Goodwin, 1975; Smith, 1952). In addition, much of the forage inventoried was comprised of low quality browse such as pinyon, juniper, and Oregon grape. Forbs and grass comprised an average of only 6 and 4 percent of the diets, respectively. The most predominent forbs were alfalfa, penstemon, and lupines, while the most predominant grasses were crested wheatgrass, bluegrass, and fescue.

Because these initial diets overestimated the amount of forage available, seasonal limitations on the amounts of browse, forbs, and grass allowed in deer diets were developed. These "target diets" were based upon published food habit studies (Kufeld et al., 1973; Trout and Thiessen, 1968; and Goodwin, 1975).

In addition to species composition, a rough analysis of the crude protein content of inventoried diets was conducted using values published by Cook (1972). This analysis showed that the diets inventoried averaged about 9 percent crude protein. This value is slightly lower than the value determined necessary by Hill (1969) for proper growth of mature mule deer. In addition, because of the low digestibility of shrubs and disproportionate amount in these diets, it is doubtful that Henry Mountain deer, especially fawns and lactating does, could get enough protein to meet their daily summer requirements. This also confirms Pederson's and Harper's suspicion that the Henry Mountain summer ranges are deficient in protein.

In summary, the analysis of inventory data: (1) confirms Pederson's and Harper's findings that crucial deer summer range on the Henry Mountains is dominated by low quality shrubs; (2) these ranges are deficient in protein because of a lack of nutritious forbs and, therefore, herd productivity is poor; (3) the summer diets inventoried are nutritionally deficient because of poor quality forage; and (4) unless there is a significant change from a shrub-dominated to a more perennial forb-and-grass vegetation type (good ecological condition), these ranges will remain poor quality deer summer habitat.

Because deer numbers are at a low, static level and crucial summer range is a major factor limiting deer productivity and numbers, any proposed alternative that would maintain and/or further degrade the grazing capacity of this range must be considered adverse to the deer herd.

In 1974, a total of 4,800 AUMs on BLM lands were allocated to deer (USDI, BLM, 1974). Of this total, nearly 1,084 AUMs were allocated on BLM lands to deer on crucial summer ranges. This allocation was based on a 1962-63 range survey conducted by BLM which assigned proper use factors (PUFs) to determine the maximum allowable seasonal utilization of forage by big game and livestock. Based on a conversion factor of 5.8 deer/AUM (Stoddart and Smith, 1955), an allocation of 4,800 AUMs should have provided sufficient forage to support a total yearlong deer population of 2,320 animals on the planning area. Population and trend data suggest, however, that total deer numbers have remained relatively static and that current numbers on the planning area are estimated to be 52 percent (1,211 animals) of that provided for in the 1974 decision document. This difference becomes even more evident on crucial summer ranges where current deer numbers on BLM-administered lands are estimated to be only 34 percent of that provided for in the 1974 decision (362 animals as compared to 1,050).

This data, along with the earlier findings of Pederson and Harper (1978), suggests that allocations based solely on the quantity of available forage as determined by PUFs, without regard to such factors as (1) the seasonal dietary requirements of an animal; (2) the nutritional quality of the allocated forage; and (3) forage competition factors, overestimate the number of nutritionally suitable AUMs available to deer, especially on crucial summer ranges. In addition, other factors such as the ecological condition of the range, poor livestock distribution, and the proximity of escape and cover habitats to feeding areas can also greatly affect the amount of suitable forage available to big game species.

If it is assumed that current deer numbers are reflective of the grazing capacity on crucial summer ranges, then only approximately 34 percent of the total AUMs provided to mule deer can be assumed nutritionally adequate to support deer and/or are useable to them.

The data shows that the grazing capacity is far below what has been identified; therefore, a 34-percent adjustment factor will be used throughout the deer analysis on crucial summer ranges only. This adjustment will better assess the impacts of each alternative to present and future deer numbers.

Inventory data shows that the quantity and quality of forage on crucial winter ranges should not be a limiting factor for Henry Mountain deer populations. Approximately 28,265 acres (69 percent) are in a mid seral stage and are considered good deer winter range. In addition, in their comparison study between the highly productive LaSal Mountains and the Henrys, Pederson and Harper (1978) stated: "...although Henry Mountain winter ranges are somewhat drier and less productive (about 20 percent less yield than on the LaSal Mountains), forage quality and plant vigor actually appear to be slightly better than on the LaSals."

Because these data suggest that inventoried AUMs on crucial winter ranges are of sufficient quantity and quality to meet a deer's seasonal dietary requirements for each alternative, no adjustments to these figures will be made.

## ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

### *Crucial Summer Range*

Under this alternative, active livestock preference on eight allotments containing crucial summer range would be reduced from 16,708 AUMs to the average 5-year licensed use of 8,324 AUMs. Of this amount, 118 sheep AUMs would be used intermittently (see Table 2-2).

Current deer use on these crucial ranges is estimated at 374 AUMs. However, only 127 of these AUMs are considered nutritionally adequate or useable to mule deer (see Table 4-3).

Therefore, because: (1) deer numbers have remained at a low, static level under average licensed livestock use; (2) summer range is considered a major factor limiting deer populations on the Henry Mountains; and (3) competition for high quality summer forage between livestock and deer would not decrease, no change in deer herd numbers or productivity would be expected under this alternative.

TABLE 4-3

Allotment Analysis of Nutritionally Suitable Forage on Crucial Summer Range[a] (AUMs)

| Allotments | Alternative A[b] | B[b] | C[b] | D[b] | E[b] |
|---|---|---|---|---|---|
| Burr Point | 1 | 3 | 1 | 1 | 0 |
| Crescent Creek | 26 | 73 | 85 | 26 | 85 |
| Dry Lakes | 18 | 44 | 42 | 18 | 42 |
| Nasty Flat | 19 | 73 | 56 | 18 | 44 |
| Pennell | 25 | 66 | 156 | 25 | 124 |
| Rockies | 4 | 16 | 2 | 2 | 2 |
| Sawmill Basin | 30 | 73 | 72 | 30 | 47 |
| Trachyte | 4 | 20 | 9 | 4 | 8 |
| Total AUMs | 127 | 368 | 423 | 124 | 352 |

[a]Includes only BLM-administered lands.

[b]Adjusted by 0.34 to account for poor quality forage on crucial summer range.

TABLE 4-4

Allotment Analysis of Nutritionally Suitable Deer Forage on Crucial Winter Range[a] (AUMs)

| Allotments | Alternative A | B | C | D | E |
|---|---|---|---|---|---|
| Blue Bench | 1 | 4 | 5 | 1 | 5 |
| Bullfrog | 22 | 37 | 143 | 22 | 143 |
| Cedar Point | 33 | 59 | 54 | 33 | 34 |
| Nasty Flat | 6 | 18 | 6 | 6 | 5 |
| Pennell | 88 | 186 | 303 | 88 | 167 |
| Steele Butte | 54 | 125 | 189 | 54 | 188 |
| Trachyte | 27 | 67 | 165 | 27 | 148 |
| Total AUMs | 231 | 496 | 865 | 231 | 690 |

[a]Includes only BLM-administered lands.

### *Crucial Winter Range*

Active livestock preference on seven allotments containing crucial winter range would be reduced from 20,887 AUMs to the average 5-year licensed use of 9,418 AUMs. Of this amount, 164 sheep AUMs would be used intermittently (see Table 2-2).

Current deer use on these crucial ranges is estimated at 231 AUMs, or approximately 15 percent of the total AUMs needed to satisfy prior stable deer forage requirements (see Figure 4-1).

Because crucial winter range is not considered a major factor limiting herd size and because there is sufficient forage to meet current deer numbers, this alternative should not affect the Henry Mountain deer herd in the winter.

## ALTERNATIVE B: NO ACTION

### *Crucial Summer Range*

Deer would be provided existing reservations of 1,084 AUMs on eight allotments containing crucial summer range. However, only 368 AUMs are considered nutritionally suitable/useable to deer during the summer (see Table 4-3). Therefore, this alternative would provide approximately 16 percent of the total AUMs needed to meet prior stable deer forage requirements on crucial summer range (see Figure 4-1).

Under this alternative, livestock use on seven allotments containing crucial summer range would increase to active preference (16,708 AUMs). This would represent an increase of 8,205 AUMs over the 5-year average licensed livestock use.

This alternative could adversely impact deer by decreasing their numbers and productivity because: (1) an increase in livestock use on crucial summer deer range would increase competition for highly nutritious forage; (2) crucial summer range is considered a major factor limiting deer populations; and (3) deer numbers are low under current grazing levels.

### *Crucial Winter Range*

Deer would be provided existing reservations of 496 AUMs on seven allotments containing crucial winter range (see Table 4-4). This is 265 more than the 234 AUMs needed to satisfy current deer numbers on crucial winter range (see Figure 4-1).

Under this alternative, livestock use on seven allotments containing crucial deer winter range would be allowed to increase to the active preference level (20,887 AUMs). This represents an increase of 11,469 AUMs over the 5-year average licensed use of 9,418 AUMs on these seven allotments (see Table 2-2).

Even though crucial deer winter range is in good condition and is not considered to be a major limiting factor, an increase of approximately 122 percent in livestock use would reduce the productivity of this range and impair its ability to provide forage requirements for existing deer reservations. Therefore, this alternative could adversely impact the deer winter herd.

Antelope bitterbrush

## ALTERNATIVE C: OPTIMIZE BIG GAME

### *Crucial Summer Range*

Proposed forage use levels under this alternative were based on prior stable deer numbers provided by UDWR. Although 2,339 AUMs were required on crucial deer summer range to satisfy prior stable forage requirements, the inventory indicated that only 1,245 AUMs are available. Of this amount, only 423 AUMs are considered nutritionally adequate/useable to mule deer (see Table 4-3). This represents an increase of 296 AUMs over the current use of 127 AUMs (see Figure 4-1).

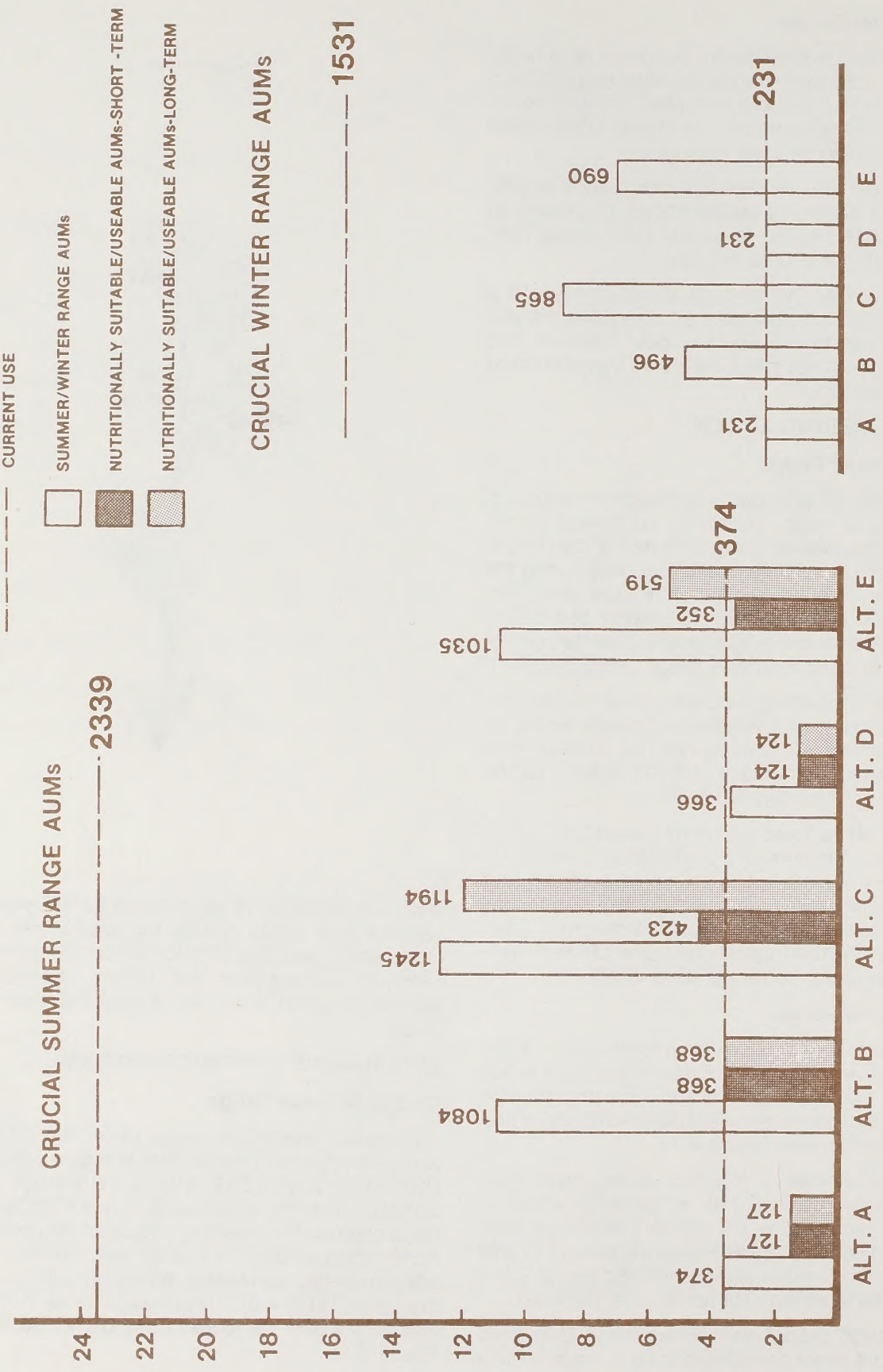



FIGURE 4-1

MULE DEER SUMMER AND WINTER RANGE FORAGE AUMs

Under this alternative, no livestock grazing would be allowed on Crescent Creek, Nasty Flat, Pennell, and Sawmill Basin Allotments (see Table 2-2). The reductions in livestock use on crucial summer ranges would provide additional herbaceous forage (i.e., grasses and forbs) to deer during a critical period in their life cycle. In addition, because livestock would be removed from these crucial ranges, it is estimated that rangeland improvement projects would increase deer forage by 771 nutritionally adequate/useable AUMs (see Figure 4-1). As noted earlier, an important factor contributing to the low numbers and static trend of the Henry Mountain deer herd is the scarcity of forbs and early-season grass production. Improved nutritional levels resulting from this alternative would increase deer productivity and survivability, thus resulting in an upward trend in population. However, even with land treatments and livestock reductions, there would not be sufficient forage to meet prior stable numbers on these crucial ranges (Figure 4-1).

### *Crucial Winter Range*

Under this alternative, 865 AUMs would be provided to deer on crucial winter ranges (see Table 4-4). This is approximately 56 percent of the AUMs needed to satisfy prior stable deer forage requirements (see Figure 4-1). Eliminating winter sheep use on the Trachyte Allotment would reduce competition between sheep and deer for high quality browse, enhancing the ability of crucial winter range to support deer. It is doubtful, however, that this alternative would provide sufficient forage to meet prior stable deer forage requirements in the long term.

## ALTERNATIVE D: OPTIMIZE LIVESTOCK

### *Crucial Summer Range*

Deer would be provided 366 AUMs on seven allotments containing crucial summer deer range. However, only 124 AUMs are considered nutritionally suitable/useable to meet mule deer requirements. This alternative proposes a slight decrease of nutritionally adequate AUMs over that currently available. Because of increased competition for high quality summer forage resulting from increased livestock use, this alternative would probably reduce deer populations and productivity below current numbers. Also, because the additional AUMs generated from land treatments would go mostly to livestock, deer numbers would not be expected to increase in the long term.

### *Crucial Winter Range*

Because inventory data suggests that crucial winter range is not the major factor limiting deer populations and because of the quantity and quality of winter forage, this alternative should not adversely impact deer numbers and productivity in the short term. However, because of increased livestock use resulting in increased competition for winter forage, deer numbers would not be expected to increase in the long term.

## ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

### *Crucial Summer Range*

This alternative recommends that 1,035 AUMs be provided to deer on eight allotments containing crucial summer deer range (Figure 4-1). However, only 352 AUMs are considered nutritionally suitable/useable to mule deer (Table 4-3). This alternative, therefore, recommends an actual increase of 225 nutritionally suitable/useable AUMs over that currently available.

Because the proposed forage use level is in excess of current use, this alternative could provide forage for additional deer numbers in the short term. The increase in deer populations would depend on the amount and quality of herbaceous vegetation and its accessibility to livestock grazing. A major factor also influencing deer populations would be the amount and period of livestock use. Cattle use could increase on five of seven allotments on crucial deer summer range. If this occurred, competition for high quality forage could increase during this critical period. Therefore, an increase in cattle use could reduce the availability of high quality forage to deer and adversely impact deer numbers and productivity.

With the exception of the Pennell Allotment, proposed sheep grazing would have limited impacts on summer deer ranges because of the period of use and availability of high quality winter browse. The only possible conflicts between sheep and deer would occur during the spring months when both species were competing for high quality herbaceous vegetation.

Land treatments would provide approximately 167 additional nutritionally suitable/useable AUMs to deer on crucial summer ranges in the long term under this alternative. This is approximately 22 percent of the AUMs required to reach prior stable number forage requirements. Therefore, deer populations would not be expected to reach prior stable levels on these ranges.

### *Crucial Winter Range*

Because of the high quality and quantity of winter browse available, this alternative should not adversely impact deer numbers or productivity in the short term. However, because of increased livestock use on deer winter ranges, it is doubtful that populations would reach prior stable levels in the long term.

### CONCLUSION

None of the alternatives would provide enough high quality useable summer forage to enable deer numbers to reach UDWR's prior stable numbers.

Deer numbers would be expected to remain at current levels both in the short and long terms under Alternative A. Because of increased livestock use over the 5-year average licensed livestock use (especially on crucial summer ranges) and increased competition for highly nutritious summer forage, deer numbers and productivity would be expected to decline both in the short and long terms under Alternatives B and D.

Alternative C would eliminate livestock use on crucial summer deer range; change the shrub-dominated summer ranges to a more perennial forb and grass vegetational type in the long term; reduce competition for highly nutritious summer forage; and increase deer numbers and productivity both in the short and long terms. It is estimated that this alternative could increase deer numbers on crucial summer ranges by approximately 793 animals over current levels in the long term.

Under Alternative E, deer numbers would be expected to increase slightly both in the short and long terms. However, because of land treatment projects and livestock reductions on crucial summer ranges, resulting in less forage competition, deer numbers on these ranges would be expected to increase by approximately 300 animals over current levels in the long term.

## Bison

Research on bison diets indicates that these animals are almost exclusively dependent on grass and use only small amounts of forbs and browse. However, much of the research has been conducted in a plains or prairie environment where grass is the dominant vegetation. There has been limited documentation of bison diets in habitats where grass is a minor part of the vegetation composition on some of the seasonal ranges, as is the situation with the Henry Mountain bison herd.

Although rumen samples are most helpful in identifying plant species eaten by grazing animals, they are not an accurate method of determining dietary composition: forbs are underestimated or lost entirely and grasses are generally overestimated (Mclurves, 1977).

Preliminary data from fecal and rumen samples taken from the Henry Mountain herd suggests that these animals use grass as the major component of their diets, despite its limited availability on all but seeded areas. Most of the fecal samples analyzed for dietary composition were taken from seeded range and could be expected to contain high amounts of grass. These diets showed a composition (corrected for underestimation of forbs) of 82 percent grass, 16 percent forbs, and 2 percent browse.

Nelson (1965) studied dietary composition of rumen samples collected from desert and foothill range on the Henry Mountains in the late fall and winter months during 1961-64. He made the general observations that grass comprised the bulk of the diet and that the relative amount of browse was greater in the winter months than in the summer, although browse was only a minor component during either season.

Rumen sample analysis of bison killed during the 1980 hunt showed very low percentages of browse in their diets, with most animals under 5 percent. However, some individuals showed a diet of over 20 percent browse (USDI, BLM, 1981b). Some animals were killed on seedings while others were killed on areas where browse was the dominant vegetation. It was not possible to correlate grass availability with percentage of grass in the diet because it was not known how long the animals had been in the area where they were killed.

In conclusion, it appears that the Henry Mountain bison herd has retained its grazing nature in a habitat where browse species often dominate much of the seasonal range. Fecal studies on samples collected from seeded range show browse to be a very minor (<5 percent) component of bison diets. The percentage of forbs in these diets (16 percent) is somewhat higher than in other reports, but is attributable to the high palatability of alfalfa present in the seedings. The amount of browse in the diets of individuals killed on winter range has been as high as 23 percent. In the absence of sufficient quantitative diet analysis, it is difficult to conclusively determine the reasonable maximum use of browse in bison diets. The fact that bison

thrive in a habitat that includes seasonal ranges dominated by browse suggests that some dietary adjustment to include relatively more browse has been made, and that perhaps a dietary composition of 10 percent browse could be expected on certain ranges during certain times of the year.

Tables 4-5, 4-6, and 4-7 list the short-term bison AUM requirements on crucial summer, winter, and yearlong ranges, respectively, by alternative. It is assumed that these AUMs are of sufficient quality to meet the dietary requirements of bison on the Henry Mountains. Figure 4-2 shows current use as well as long-term AUM projections for bison crucial ranges, by alternative.

### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

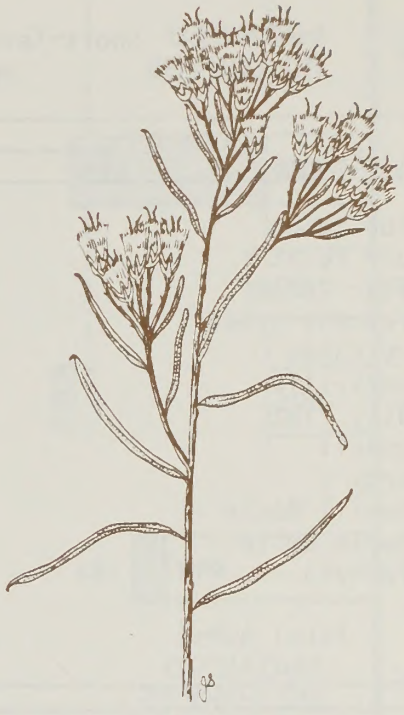
Under this alternative, current bison use would be 274 AUMs in excess of forage availability (133 AUMs on crucial winter range and 141 AUMs on crucial yearlong range) (Table 2-2). In addition, livestock grazing would exceed grazing capacity on five allotments containing crucial bison ranges (Sandy 2, Steele Butte, Trachyte, Crescent Creek and Nasty Flat Allotments) (Table 4-1). Under these grazing levels, it is expected that crucial bison ranges would deteriorate. The short-term effect of this alternative on bison would be slight. However, bison numbers would be expected to decline in the long term because of overgrazing and competition for forage with livestock, especially during the winter.

### ALTERNATIVE B: NO ACTION

Under this alternative, livestock use on 11 allotments containing crucial bison ranges would exceed grazing capacity (Table 4-1). In addition, yearlong bison use would exceed indicated grazing capacity on the Dry Lakes and Steele Butte Allotments, while bison winter use would exceed grazing capacity on the Pennell Allotment. Because of competition and overutilization, this alternative would be expected to significantly reduce bison numbers in the short term (Figure 4-2).

### ALTERNATIVE C: OPTIMIZE BIG GAME

Under this alternative, bison use would be 3,768 AUMs, 156 percent of the current use (2,412 AUMs). Livestock grazing would be eliminated on five allotments containing crucial summer, winter, and yearlong range (Table 2-2). Eliminating livestock use on these crucial ranges would provide additional forage to bison. It is expected that this forage, in addition to the AUMs provided by land treatments, would allow bison numbers to increase to UDWR's long-term management goals (Figure 4-2).



### ALTERNATIVE D: OPTIMIZE LIVESTOCK

Because of the competition between cattle and bison for forage, this alternative provides no forage for bison. Therefore, the bison herd would be eliminated.

### ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

Forage provided for bison would be reduced by 301 and 29 AUMs below current use levels on crucial summer and winter ranges, respectively. However, because of the additional AUMs provided from land treatments, sufficient forage would be made available to prevent overgrazing by bison on these ranges in the long term (Table 2-4). However, overgrazing (118 AUMs) would still occur on crucial winter range (Table 2-4). Because winter range is considered to be the major factor limiting the herd, bison numbers are not expected to meet existing numbers under this alternative.

### CONCLUSION

Alternative C is the only alternative that would meet both the short and long-term UDWR management goals for bison without overutilizing the range. Alternatives A and E would maintain current herd size in the short term; however, both alternatives would decrease bison numbers in the long term. Alternative B would result in significant rangeland deterioration and greatly reduced bison numbers, while Alternative D would result in extirpation of the bison herd.

TABLE 4-5

Short-Term Allotment Analysis of Bison Forage on Crucial Summer Range (AUMs)

| Allotments | Alternative A | B | C | D | E |
|---|---|---|---|---|---|
| Blue Bench | 5 | 16 | 5 | 0 | 4 |
| Burr Point | 15 | 13 | 28 | 0 | 15 |
| Cedar Point | 8 | 10 | 5 | 0 | 6 |
| Crescent Creek | 65 | 55 | 159 | 0 | 55 |
| Dry Lakes | 73 | 65 | 100 | 0 | 52 |
| Hanksville | 18 | 16 | 35 | 0 | 18 |
| Nasty Flat | 457 | 404 | 652 | 0 | 348 |
| Pennell | 576 | 569 | 1,194 | 0 | 456 |
| Sandy 2 | 17 | 10 | 33 | 0 | 17 |
| Sawmill Basin | 146 | 131 | 133 | 0 | 114 |
| Steele Butte | 17 | 15 | 34 | 0 | 17 |
| Trachyte | 20 | 11 | 20 | 0 | 14 |
| Total AUMs | 1,417 | 1,315 | 2,398 | 0 | 1,116 |

TABLE 4-6

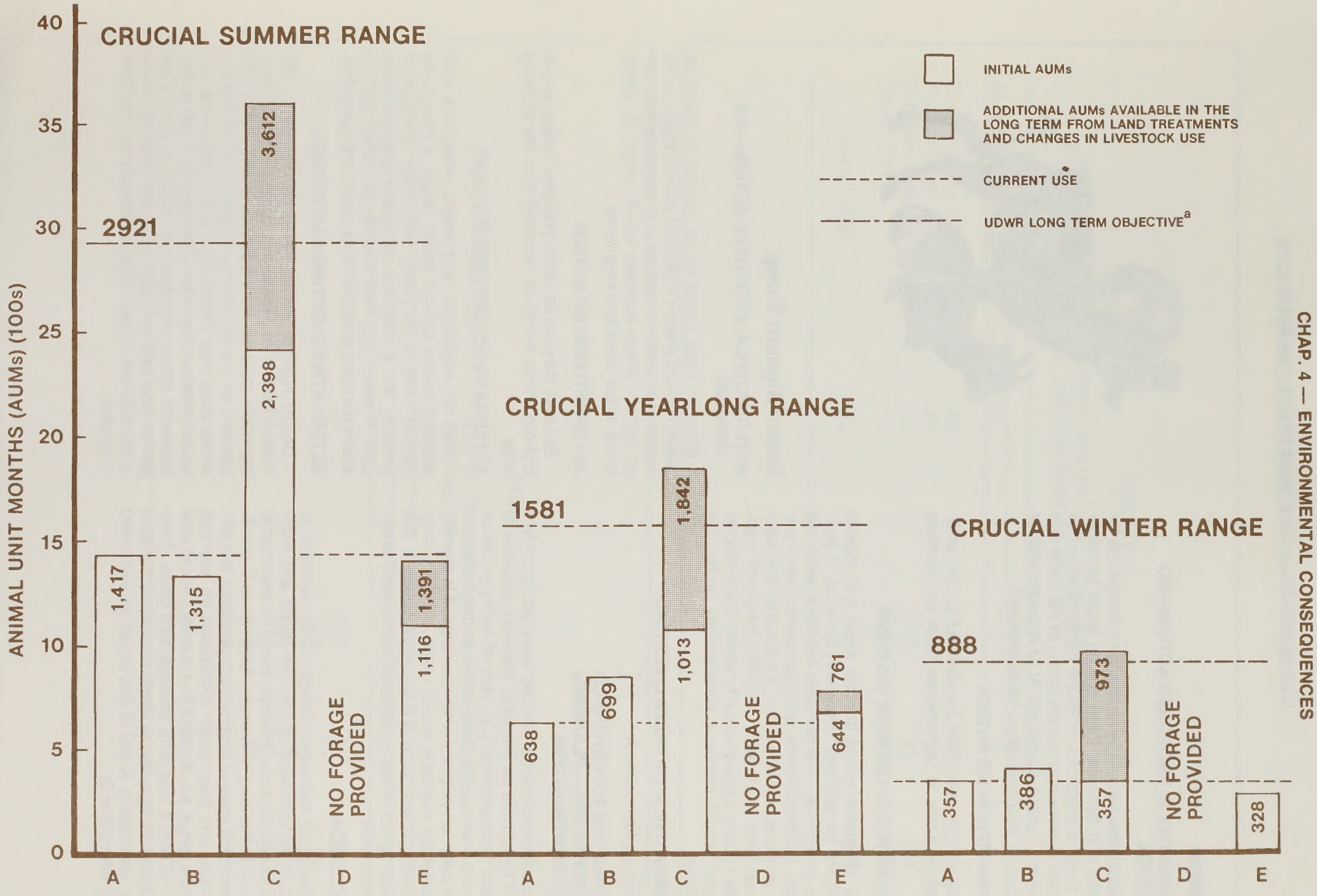
Short-Term Allotment Analysis of Bison Forage on Crucial Winter Range (AUMs)

| Allotments | Alternative A | B | C | D | E |
|---|---|---|---|---|---|
| Bullfrog | 74 | 36 | 74 | 0 | 45 |
| Pennell | 0 | 10 | 0 | 0 | 0 |
| Sandy 2 | 105 | 120 | 105 | 0 | 105 |
| Steele Butte | 178 | 220 | 178 | 0 | 178 |
| Total AUMs | 357 | 386 | 357 | 0 | 328 |

TABLE 4-7

Short-Term Allotment Analysis of Bison Forage on Crucial Yearlong Range (AUMs)

| Allotments | Alternative A | B | C | D | E |
|---|---|---|---|---|---|
| Dry Lakes | 27 | 125 | 11 | 0 | 36 |
| Nasty Flat | 228 | 208 | 218 | 0 | 228 |
| Pennell | 376 | 347 | 777 | 0 | 373 |
| Steele Butte | 7 | 19 | 7 | 0 | 7 |
| Total AUMs | 638 | 699 | 1,013 | 0 | 644 |




[a]AUMs IN EXCESS OF UDWR LONG-TERM OBJECTIVES WOULD AFTER ACHIEVEMENT OF OBJECTIVE NUMBERS, BE AVAILABLE FOR ALLOCATION TO OTHER ANIMALS, TO INCLUDE LIVESTOCK.

FIGURE 4-2

BISON FORAGE AUMs ON CRUCIAL RANGES

## Antelope

### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

Because there would be no change in forage use for antelope and because there are no water development projects proposed, antelope numbers would be expected to remain at current levels in the short and long terms. Table 4-8 analyzes AUM requirements for antelope on yearlong range by alternative.

### ALTERNATIVE B: NO ACTION

Because they would not be provided forage, antelope would have to be removed from the planning area.

### ALTERNATIVE C: OPTIMIZE BIG GAME

This alternative would develop water and provide 960 AUMs for antelope. However, because of poor forage quality (i.e., lack of highly nutritious forbs and browse), low precipitation, and poor distribution of water on yearlong antelope range, it is doubtful that antelope numbers would reach UDWR's long-term management goals. It is expected, however, that antelope numbers would increase substantially under this alternative.

### ALTERNATIVE D: OPTIMIZE LIVESTOCK

Same as Alternative A.

### ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

This alternative would develop water and provide a total of 695 AUMs for antelope. However, because of the poor forage quality (i.e., lack of highly nutritious forbs and browse), low precipitation, and poor distribution of water on yearlong antelope range, it is doubtful that antelope numbers would reach UDWR's long-term management goals. It is expected, however, that antelope numbers would increase substantially under this alternative.

### CONCLUSION

Because of increased forage made available to antelope by increased forage use levels and water development projects, antelope would be expected to increase in the long term under Alternatives C and E. However, because of the poor forage quality, low precipitation, and poor water distribution on yearlong antelope range, it is doubtful that numbers would ever reach UDWR's long-term management goals. Antelope would be expected to remain at current numbers under Alternatives A and D and would be eliminated under Alternative B.

## Desert Bighorn Sheep

### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

Because there would be no change in forage for desert bighorn sheep (75 AUMs) and no change in the numbers or kinds of livestock, it is estimated that desert bighorn sheep numbers would remain at current levels in the short and long terms.

### ALTERNATIVE B: NO ACTION

Because they would not be provided forage, desert bighorn sheep would be removed from the planning area.

### ALTERNATIVE C: OPTIMIZE BIG GAME

With the elimination of domestic sheep use from yearlong desert bighorn sheep range, a forage use level of 3,968 AUMs (Table 4-9), water development projects, and a proposed transplant program in the Little Rockies and Flint Trail areas, desert bighorn sheep numbers would increase under this alternative.

### ALTERNATIVE D: OPTIMIZE LIVESTOCK

Desert bighorn sheep would be provided 2,336 AUMs (Table 4-9). However, because livestock grazing would increase from 8,550 to 19,899 AUMs (233 percent) on the six allotments where desert bighorn sheep occur (see Table 2-2), and domestic sheep use would increase from intermittent use to 4,108 AUMS (domestic sheep are carriers of diseases which have proven fatal to desert bighorn sheep), this alternative could eliminate desert bighorn sheep from the planning area.

TABLE 4-8

Allotment Analysis of Antelope Forage
on Yearlong Range (AUMs)

| Allotments | Alternative | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| Burr Point | 18 | 0 | 277 | 18 | 18 |
| Hanksville | 19 | 0 | 129 | 19 | 129 |
| Robbers Roost | 31 | 0 | 374 | 31 | 374 |
| Cedar Point | 19 | 0 | 180 | 19 | 174 |
| Total AUMs | 87 | 0 | 960 | 87 | 695 |

TABLE 4-9

Allotment Analysis of Desert Bighorn Sheep Forage
on Yearlong Range (AUMs)

| Allotments | Alternative | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| Rockies | 16 | 0 | 832 | 16 | 794 |
| Trachyte | 16 | 0 | 64 | 17 | 64 |
| Flint Trail | 0 | 0 | 808 | 808 | 808 |
| Sewing Machine | 21 | 0 | 897 | 925 | 897 |
| Robbers Roost | 22 | 0 | 819 | 22 | 819 |
| Little Rockies | 0 | 0 | 548 | 548 | 548 |
| Total AUMs | 75 | 0 | 3,968 | 2,336 | 3,930 |

#### ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

Desert bighorn sheep would be provided a total of 2,574 AUMs on the Rockies, Trachyte, Sewing Machine, and Robbers Roost Allotments (Table 4-9). However, domestic livestock use would increase from 8,550 to 15,912 AUMs (186 percent) on these same four allotments (see Table 2-2). Domestic sheep would use 1,675 of these AUMs on the Trachyte and Rockies Allotments.

It is expected that the potential for increases in desert bighorn sheep numbers from increased forage use and water development projects could be offset by increases in livestock use, especially domestic sheep, on Trachyte, Sewing Machine, Rockies, and Robbers Roost Allotments.

Under this alternative, 1,356 AUMs would be provided to accommodate a desert bighorn sheep transplant program in the Little Rockies and Flint Trail Allotments. Both of these are currently unallocated for livestock use. Therefore, desert bighorn sheep numbers would be expected to increase significantly on these two areas.

#### CONCLUSION

Desert bighorn sheep numbers could reach UDWR's long-term management goals on all areas where they currently exist as well as proposed transplant sites under Alternative C. Desert bighorn sheep could reach UDWR's long-term management goals on only Little Rockies and Flint Trail Allotments under Alternative E. Under Alternative A, desert bighorn sheep numbers would be expected to remain at current levels. Under Alternative B, bighorn sheep would be eliminated from the planning area. Bighorn sheep could also be eliminated under Alternative D because of the increase in livestock, especially domestic sheep grazing.

### Feral Goats

No impacts to feral goats have been identified.

### Wild Burros

One hundred AUMs would be provided for burros in the Robbers Roost Allotment under all alternatives. No adverse impacts to burros are expected; however, it is possible that burros could increase above present numbers.

### Fish

#### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

Important habitat components for fish are temperature, cover, and stabilized streambanks. These components are provided primarily by the adjacent riparian vegetation. Because Muddy Creek, Fremont, and Dirty Devil Rivers do not provide the necessary factors required for a productive fishery, no impacts to fish populations or fish habitat would be expected. Because the current level of use would not change under this alternative, the riparian habitat along the Colorado River would not be adversely impacted; therefore, fish populations and habitat would not change from the existing situation.

#### ALTERNATIVES B, C, D, AND E

The Colorado River and Lake Powell are the only productive fisheries within the planning area. Both are within National Park and Recreation Areas. Because of the limited access for livestock and the size and turbidity of the Colorado River, none of the proposals under these alternatives would be expected to adversely impact fish populations or habitat.

#### CONCLUSION

No adverse impacts are expected for any fish species inhabiting Muddy Creek, Fremont, Dirty Devil, and Colorado Rivers or Lake Powell.

## VISUAL RESOURCES

Visual impacts would result from rangeland developments, land treatments (chaining, spraying, or burning and seeding), or grazing use. These change agents impact the landform, vegetation or structural components of the landscape. The degree of impact (contrast created) would depend on how the actions were planned, designed, located, constructed, or implemented. Impacts are most noticeable when the activity is in the foreground-middleground viewing zone (visible and less than 5 miles from travel routes/viewpoints). Generally, the contrast with the existing landscape created by an activity varies over the life of the project or activity. The visual impacts of construction and land treatment projects would be most noticeable during the first 5 years after the action and diminish over time (Brown and Kissel, 1979).

Impacts of long duration can result from grazing use. Continued overgrazing causes progressive deterioration of visual resources which can, depending on the range site and extent of degradation, take from a few years to several decades to recover.

The visual resource management (VRM) classes assigned define the management objectives (see

Chapter 3, Visual Resources section). The degree of contrast caused by an activity determines if it meets or exceeds those class objectives. Allowable contrast guidelines are defined in BLM Manual 8431, which specifies procedures for assessing potential visual impacts. If the contrast with the existing landscape expected from a proposed activity would exceed the VRM class objectives, the impact has been considered significant in this analysis.

## Alternative A: Proposed Action—No Change

Since no new rangeland improvements are proposed by this alternative, the only impacts to visual resources would be caused by overgrazing on the allotments identified in Table 4-1. The impacts on vegetation would initially affect the scenic quality of that element of the landscape and, eventually, other elements (because of increased erosion, stock paths, etc.). The downward trend on Nasty Flat would continue and the extent of overgrazing on Crescent Creek, Dry Lakes, and Sandy 2 would result in a progressive deterioration of scenic values on these allotments; thus, in the long term, VRM objectives might not be met. Three of the allotments are on Mt. Ellen, part of the area rated highest in scenic quality. The other allotment, Sandy 2, borders Capitol Reef National Park. Thus, while the areas where adverse effects would be expected constitute a small portion of the planning area (approximately 5 percent), they are some of the most scenic and visually sensitive areas.

## Alternative B: No Action

The adverse impacts would be similar to those in Alternative A, only greater in magnitude. On 14 allotments (Blue Bench, Bullfrog, Cathedral, Cedar Point, Crescent Creek, Dry Lakes, Nasty Flat, North Bench, Rockies, Sandy 1 and 2, Sawmill Basin, Steele Butte, and Trachyte), it is expected that overgrazing would create or continue a visually perceptable downward trend in vegetation. Thus, progressive deterioration of the visual resources on those allotments, comprising approximately 47 percent of the area, would be expected. The areas affected include three allotments on the west side of the Henry Mountains, two of which border Capitol Reef National Park, and four allotments on Mt. Ellen. The major travel routes (U-24, U-95, and U-276) pass through the other affected allotments. Thus, the areas involved constitute the most visually sensitive areas and some of the highest quality visual resources.

## Alternatives C, D, and E

The impacts on visual resources from implementation of any of these alternatives would be identical because each proposes the same level of vegetation utilization and the same rangeland improvements.

The only allotment where grazing use would cause visually perceptible impacts is Dry Lakes. Also, the land treatment (1,300 acres) proposed for this allotment would not meet VRM Class II management objectives.

Portions of land treatments (totaling 22,650 acres) proposed for seven other allotments could also violate VRM Class II management objectives. Class III and IV portions of these allotments (Bullfrog, Nasty Flat, Pennell, Rockies, Sandy 2, Steele Butte, and Trachyte) would experience degradation of visual resources until vegetation was reestablished (up to 5 years).

Proposed rangeland developments (new reservoir and pipeline construction) would create contrasts exceeding VRM Class II or III objectives on 14 allotments (Blue Bench, Burr Point, Cedar Point, Flint Trail, Hanksville, Nasty Flat, Pennell, Robbers Roost, Sandy 1 and 2, Sawmill Basin, Sewing Machine, Steele Butte, and Trachyte).

Thus, under Alternatives C, D, and E, VRM objectives would not be met on 17 allotments. The areas that would be affected comprise some of the highest quality scenery in the planning area. While design and construction in accordance with BLM Manual 8431 would mitigate or reduce visual impacts, the proposed projects would alter the existing landscape and could create long-term contrasts.

## Conclusion

Under Alternative A, the visual resources on four allotments would be affected by overgrazing, and VRM objectives might not be met. The areas affected represent some of the highest scenic quality and visually sensitive resources in the planning area. Alternative B would have the greatest impact on visual resources. Overgrazing on 14 allotments (47 percent of the planning area) could cause progressive deterioration of visual resources along the major travel routes and in areas of highest scenic quality and visual sensitivity. The impacts under Alternatives C, D, or E would be nearly identical. The rangeland improvements under these alternatives might not meet VRM objectives. The areas affected would constitute less than 2 percent of the planning area; however, the bulk of the land treatments would be in the area rated highest in scenic quality (Mt. Ellen/Mt Pennell).

Recovery from the impacts of overgrazing and land treatments could take up to several decades in Class II areas. The impacts from reservoir construction would last into the long term. Underground pipelines would be substantially unnoticeable once vegetation on disturbed areas was reestablished.

# WILDERNESS

Impacts to wilderness resource values would generally correspond to those identified in the visual resources discussion above. The effects would result from the same change agents, and the magnitude of impacts could be comparable. Vegetation overutilization could increase the impacts of grazing and, although some rangeland improvements could enhance wilderness values by better protecting the rangeland's natural condition, rangeland improvements could generally increase "the imprint of man's work". Non-impairment criteria of the BLM's Interim Management Policy (IMP) for Wilderness Study Areas (WSAs) and areas under appeal might not be met. In this analysis, impacts resulting from actions expected to violate non-impairment criteria have been considered. Actions violating the criteria could not be taken while the lands are under IMP management, except where "grandfathered" grazing use is authorized. Therefore, design and construction of rangeland improvements proposed in WSAs and appeal areas would have to meet non-impairment criteria. Otherwise, the improvement would have to be eliminated or construction delayed until Congress decides which areas to include in the National Wilderness Preservation System (NWPS) and which to release from IMP management for other multiple uses.

## Alternative A: Proposed Action—No Change

Under this alternative, use would exceed grazing capacity on six allotments (Crescent Creek, Dry Lake, Nasty Flat, Sandy 1 and 2, and Trachyte). On all allotments except Sandy 1 and Trachyte, vegetation overutilization would be expected to result in increased rangeland deterioration. A portion of Crescent Creek Allotment is within the Bull Mountain WSA (242). Dry Lakes Allotment and a portion of Nasty Flat Allotment are within the boundary of Mt. Ellen WSA (238). A large portion of Sandy 2 Allotment is within an area under appeal contiguous to Mt. Ellen WSA. Overgrazing on these allotments could violate the IMP non-impairment criteria and affect their wilderness suitability. However, because grazing is a "grandfathered" use protected under Section 603(c) of the Federal Land Policy and Management Act (FLPMA), the level of grazing use proposed in this alternative would be allowable until a final decision is made by Congress whether or not to preserve the area as wilderness. Overutilization would only occur in isolated areas within WSA boundaries.

Generally, the areas within WSAs are either too far from water, too rugged and steep, or do not contain enough suitable livestock forage to receive significant use by livestock.

## Alternative B: No Action

Under this alternative, use would exceed grazing capacity on 18 allotments (see Table 4-1). Table 4-10 identifies 12 of those allotments which contain portions of WSAs or areas under appeal where increased impacts from grazing would probably occur. The table also identifies the six WSAs and/or areas under appeal contiguous to those WSAs that could be affected.

Grazing use above the level occurring at the passage of FLPMA (approximately the level of Alternative A) would violate the IMP non-impairment criteria. However, due to lack of water, steep terrain, and lack of suitable vegetation, overutilization would affect only small areas within allotments.

## Alternatives C, D, and E

Under Alternatives C, D, or E, five WSAs and contiguous appeal areas could be affected by rangeland improvements and overgrazing. The impacts to wilderness from implementation of these alternatives would be nearly identical since each proposes the same level of vegetation utilization and the same rangeland improvements. Under Alternatives C and E, Dry Lakes is the only allotment where overutilization could be expected. This would result from bison use and could affect the Mt. Ellen WSA (238).

Table 4-11 identifies allotments where proposed rangeland improvements may affect WSAs and/or appeal areas.

## Conclusion

Under Alternative A, impacts of overgrazing on four allotments would affect only small portions of Mt. Ellen (238) and Mt. Pennell (248) WSAs and contiguous appeal areas. However, overgrazing would not result in unavoidable adverse impacts and probably would not affect wilderness designation in the future.

Under Alternative B, increased impacts by overgrazing on 12 allotments would violate BLM IMP non-impairment criteria on portions of the six WSAs indicated in Table 4-10.

Under Alternatives C and E, increased impacts caused by vegetation overutilization by bison would be expected on one allotment in the Mt. Ellen WSA. This would violate BLM non-impairment criteria. Proposed rangeland improvements on 12 allotments under Alternatives C, D, and E would have to be designed and constructed to meet non-impairment criteria. If non-impairment criteria could not be met, rangeland improvements would have to be eliminated or the construction delayed until Congress decides which WSAs to include in the NWPS.

TABLE 4-10

Alternative B
Allotments Where Grazing Impacts
Could Affect WSAs and Areas Under Appeal

| Allotments | WSA/Appeal Area Affected |
|---|---|
| Blue Bench | Mt Ellen (238)[a] |
| Bullfrog | Mt Pennell (248)[a] |
| Cedar Point | Little Rockies (247)[a] |
| Crescent Creek | Bull Mountain (242) |
| Dry Lakes | Mt. Ellen (238) |
| Nasty Flat | Mt. Ellen (238) |
| Rockies | Little Rockies (247) |
| Sandy 1 | Appeal area (Mt. Ellen) |
| Sandy 2 | Appeal area (Mt. Pennell) |
| Sawmill Basin | Mt. Ellen (238) and Bull Mountain (242) |
| Steele Butte | Mt. Pennell (248)[a] |
| Trachyte | Little Rockies (247 and Mt. Hillers (249) |

[a]Areas under appeal could also be affected.

TABLE 4-11

Alternatives C, D, and E
Allotments Where Proposed Rangeland Improvements
Could Affect WSAs and Areas Under Appeal

| Allotment | Improvement(s) | WSA/Appeal Area Affected |
|---|---|---|
| Blue Bench | Reservoirs | Mt. Ellen (238) |
| Bullfrog | Land Treatment | Mt. Pennell (248) |
| Burr Point | Reservoir | Dirty Devil (236A) |
| Dry Lakes | Land Treatment | Mt. Ellen (238) |
| Nasty Flat | Land Treatment | Mt. Ellen (238) |
| Pennell | Land Treatment/Spring Development | Mt. Pennell (248) and Mt. Hillers (249 |
| Robbers Roost | Reservoirs | Horseshoe Canyon (237) |
| Rockies | Land Treatment | Mt. Hillers (249) |
| Sandy 2 | Land Treatment | Appeal Area (Mt Pennell) |
| Sawmill Basin | Reservoir/Spring Development | Mt. Ellen (238) |
| Steele Butte | Land Treatment and Reservoir | Mt. Pennell (248) |
| Trachyte | Land Treatment | Mt. Hillers (249) |

Recovery from the impacts of overgrazing could take from several years to several decades. However, impacts from the grazing levels proposed in any alternative would not cause changes of enough magnitude to impair any WSA's suitability for inclusion in the NWPS.

## RECREATION

Impacts to recreational resources resulting from implementation of the alternatives would be caused by grazing use, construction of rangeland improvements, or a combination of both.

Rangeland improvements could, depending on design and construction, affect primitive and general sightseeing values, at least in the short term. Development of springs where water is suitable for human consumption could, if designed and constructed to not impair primitive values, be beneficial to recreationists. Improved wildlife habitat, with resultant increases in animal numbers, especially of big game species, would increase hunting and zoologic sightseeing values.

Increased livestock grazing use could have the following effects:

1. In unfenced campgrounds (developed and undeveloped), increased fecal accumulations would reduce aesthetics and user satisfaction.

2. If grazing use exceeded capacity by a significant margin, changes in vegetation and reduction of ground cover could cause a long-term progressive decline in botanical, zoological, and general sightseeing values and degradation of primitive values.

3. If livestock use resulted in a reduction of suitable wildlife habitat and animal numbers (especially bison and deer), hunting and zoologic sightseeing values would be adversely affected.

### Alternative A: Proposed Action—No Change

Overgrazing on four allotments (Crescent Creek, Dry Lakes, Nasty Flat, and Sandy 2) would degrade primitive values in those areas. Grazing impacts on the unfenced developed facilities at McMillan Springs Campground on Nasty Flat Allotment would continue to affect the facilities, aesthetics, and user satisfaction. With the exception of bison, big game and other wildlife numbers would be expected to remain at current levels. The reduction in bison numbers anticipated in the long term would reduce hunting and sightseing values.

TABLE 4-12

Alternative B
Allotments Where Increased Livestock Grazing
Impacts Would Affect Recreation

| Allotment | Recreation Values Affected |
|---|---|
| Blue Bench | Primitive, hunting, and sightseeing (U-24 corridor) |
| Bullfrog | Primitive, hunting, and sightseeing |
| Burr Point | Primitive and sightseeing (U-95 corridor) |
| Cedar Point | Primitive and sightseeing (U-95 corridor) |
| Crescent Creek | Hunting, primitive and general sightseeing. |
| Nasty Flat | Hunting, primitive, developed (camping), and sightseeing. |
| Rockies | Hunting, primitive, and sightseeing (U-276 corridor) |
| Sandy 1 | Primitive and sightseeing (U-24 corridor) |
| Sandy 2 | Hunting and general sightseeing |
| Sawmill Basin | Primitive, hunting, and sightseeing |
| Steele Butte | Primitive, hunting, and sightseeing |
| Trachyte | Primitive, hunting, and general sightseeing. |

### Alternative B: No Action

Increased livestock grazing use would affect recreation values on the ten allotments shown in Table 4-12 (see Table 3-12 for specific resources in each allotment). In addition, bison use would continue to exceed grazing capacity on Dry Lakes Allotment which would, in time, affect primitive values.

Long-term overutilization of forage and the resultant deterioration of wildlife habitat, especially for bison and deer, would cause a progressive decline in numbers. This would significantly affect big game hunting resources and the amount of hunting activity. The decline in bison and deer numbers and the elimination of antelope and bighorn sheep would affect zoologic sightseeing values.

### Alternatives C, D, and E

Generally, the impacts to recreation resources and activities caused by rangeland improvements under these alternatives would be the same.

Construction of some improvements (reservoirs, pipelines, and land treatments) would have short- and long-term impacts on sightseeing and primitive values (intrusions and scenic quality elements). Development of potable water springs on some allotments could benefit some recreationists (hunters, hikers, sightseers, etc.). The rangeland improvements proposed for each allotment under these alternatives are shown in Table 2-4.

The following impacts of grazing use differ for each of these alternatives because forage use levels to wildlife differ and would have different effects on hunting, zoologic sightseeing, and primitive values.

1. *Alternative C: Optimize Big Game:* The proposed wildlife habitat improvements and reductions in competing livestock use would, in the long term, result in increased numbers of big game and other wildlife species. This would improve hunting, zoologic sightseeing, and primitive recreation values. Increased big game numbers would increase hunting activity. Estimates of the increases in hunter days are shown in Table 4-13.

2. *Alternative D: Optimize Livestock:* The elimination of bison from the Henry Mountains would have the most profound impact on recreation values. Zoologic sightseeing, hunting, and primitive values in the Henry Mountains would be significantly affected. The decline in deer numbers and possible long-term elimination of bighorn sheep would affect the same values. The anticipated long-term changes in hunting activity resulting from implementation of this alternative are summarized in Table 4-14.

3. *Alternative E: Preferred Alternative—Planning Recommendation:* In the long term, increases in big game numbers and improvement of wildlife habitat would occur. A small reduction in bison numbers would be expected; however, overall zoologic sightseeing, hunting, and primitive recreation values would improve. The changes in hunting activity in the long term are shown in Table 4-15.

### Conclusion

Under Alternative A, recreation values on four allotments would be affected by overgrazing. Primitive and sightseeing values and one developed campground would be impacted. Under Alternative B, overgrazing would affect recreation values on 11 allotments. In the long term, zoologic sightseeing, primitive, and big game hunting values would be affected because of progressive declines in big game numbers caused by competition for forage and impacts on habitat. This would degrade zoologic and general sightseeing, hunting, and primitive values. Rangeland improvements under Alternatives C, D, and E would have short- and long-term impacts on sightseeing and primitive recreation because of effects of intrusions on scenic and primitive values. Development of springs with potable water would benefit recreationists. Improvements in wildlife habitat under Alternatives C and E would improve zoologic sightseeing and hunting values for all big game species. Elimination of the bison herd under Alternative D would significantly affect sightseeing and hunting values. Increased numbers of bighorn sheep and antelope would improve sightseeing and hunting values.

Based on the above, Alternative C would benefit recreation values most, followed by Alternative E. Alternatives A, D, and B follow in order of increasing impact on recreation values, with B having the most adverse impacts.

## LIVESTOCK GRAZING

### Alternative A: Proposed Action—No Change

Livestock active preference (56,285 AUMs) would be adjusted to the 5-year average licensed use (26,631 AUMs). Table 3-13 shows the levels of grazing that have occurred during each of the last 5 years. Average use during that period has been 47 percent of active preference. (Table 2-2 compares average use to active preference.) Tables 4-16 and 4-17 summarize the initial forage use level and the AUM changes for the permittees in each of the size categories for each alternative.

TABLE 4-13

Estimated Big Game Hunter Days Under Alternative C

| Species | Current | Hunter Days Projected | Increase |
|---|---|---|---|
| Bison | 98 | 220 | 122 |
| Deer | 653 | 1,213 | 560 |
| Antelope | 0 | 90 | 90 |
| Bighorn Sheep | 0 | 1,900 | 1,900 |

TABLE 4-14

Estimated Big Game Hunter Days Under Alternative D

| Species | Current | Hunter Days Projected | Increase (Decrease) |
|---|---|---|---|
| Bison | 98 | 0 | (-98) |
| Deer | 653 | 538 | (-114) |
| Antelope | 0 | 0 | 0 |
| Bighorn Sheep | 0 | 0 | 0 |

TABLE 4-15

Estimated Big Game Hunter Days Under Alternative E

| Species | Current | Hunter Days Projected | Increase (Decrease) |
|---|---|---|---|
| Bison | 98 | 65 | (-33) |
| Deer | 653 | 809 | 156 |
| Antelope | 0 | 60 | 60 |
| Bighorn Sheep | 0 | 390 | 390 |

### COMPARISON OF PROPOSED LIVESTOCK USE TO ACTIVE PREFERENCE

Active preference would be reduced by an average 53 percent (29,955 AUMs) and would affect all 59 permittees. The highest relative reduction would be 96 percent (1,027 AUMs) on the Wild Horse Allotment. The greatest reduction would be 3,501 AUMs (58 percent) on the Hanksville Allotment. Crescent Creek would receive the only increase (1 percent or 3 AUMs).

### COMPARISON OF PROPOSED LIVESTOCK USE TO INVENTORY AND MONITORING STUDIES

While the soil-vegetation inventory and studies show that, overall, the planning area could supply average licensed use and existing big game use, this is not true on an individual allotment basis. The following allotments do not produce sufficient forage to maintain average licensed use and are estimated to be overutilized by the amount shown below (see also Tables 3-3 and 4-1).

| Allotment | Overutilization |
|---|---|
| Crescent Creek | 154 AUMs |
| Nasty Flat | 139 AUMs |
| Sandy 1 | 278 AUMs |
| Sandy 2 | 794 AUMs |
| Steele Butte | 178 AUMs |

On allotments where overutilization would occur, the most desirable plants would be removed and the nutrient value for livestock would be reduced. Morrison et al. (1959) have shown that 20- to 30-percent decreases in calf crops can occur under such circumstances. This would affect the livestock production for 14 permittees.

Permittees would have the responsibility of maintaining all livestock rangeland developments without the possibility of increasing their herd size to cover that increasing cost.

## Alternative B: No Action

Livestock would be allowed to graze at active preference, 56,285 AUMs. This would be 29,955 AUMs more than the 5-year average licensed use. Big game numbers would be at the 1974 reservation level of 7,200 AUMs, and burro use would be held to 100 AUMs.

### COMPARISON OF ACTIVE PREFERENCE TO AVERAGE USE

All allotments, with the exception of Crescent Creek, would receive increases in AUMs over average licensed use. Only one permittee would experience a reduction (1 percent or 3 AUMs). Use would increase 24,346 AUMs for cattle (48 percent) and 5,306 AUMs for sheep (95 percent).

The most serious overstocking would occur on Sandy 2 (212 percent), Steele Butte (167 percent), and Sawmill Basin (158 percent). (Steele Butte would have the largest amount of overstocking at 3,146 AUMs.)

Fifteen permittees on five allotments (Hanksville, Robbers Roost, Sandy 3, Sewing Machine, and Waterpocket) would receive an increase of 9,305 AUMs (includes 1,663 AUMs of sheep use), resulting in increased livestock production. (Four of these permittees would be involved with the overstocked allotments [Sandy 2, Steele Butte, and Sawmill Basin] mentioned above.)

### COMPARISON OF ACTIVE PREFERENCE TO INVENTORY AND MONITORING STUDIES

An analysis of soil-vegetation inventory and study data indicates that, considering the big game reservation, only 47,054 AUMs would be available to satisfy the remaining grazing needs. Consequently, the range would be overutilized by 9,231 AUMs. The 16 allotments which would be overutilized and the estimated percent and amounts of overutilization and percent reduction needed in active preference to achieve proper use are listed below (see also Tables 3-3 and 4-1):

| Allotment | Percent Over-utilization | Over-utilization (AUMs) | Percent Reduction in Active Preference |
|---|---|---|---|
| Blue Bench | 67 | 1,849 | 40 |
| Bullfrog | 34 | 783 | 25 |
| Burr Point | 14 | 552 | 12 |
| Cathedral | 34 | 632 | 25 |
| Cedar Point | 34 | 598 | 31 |
| Crescent Creek | 83 | 151 | 45 |
| Hartnet | 6 | 54 | 5 |
| Nasty Flat | 60 | 171 | 37 |
| North Bench | 49 | 150 | 32 |
| Pennell | 10 | 245 | 9 |
| Rockies | 29 | 1,620 | 27 |
| Sandy 1 | 39 | 311 | 31 |
| Sandy 2 | 212 | 1,513 | 67 |
| Sawmill Basin | 159 | 102 | 61 |
| Steele Butte | 167 | 3,146 | 62 |
| Trachyte | 80 | 1,269 | 44 |

As explained in Alternative A, overutilization would impact the livestock production for 44 permittees.

## Alternative C: Optimize Big Game

Active preference would be reduced to 39,804 AUMs (see Table 2-2). This is 70 percent of active preference (56,285 AUMs) and is 13,173 AUMS more than the 5-year average licensed use (26,631 AUMs).

### COMPARISON OF ALTERNATIVE USE TO ACTIVE PREFERENCE

Active preference on the Hanksville, Sandy 3, and Wild Horse Allotments would not change. Active preference would be increased on Robbers Roost, Sewing Machine, and Waterpocket Allotments. Active preference would be eliminated on four allotments (Crescent Creek, Nasty Flat, Pennell, and Sawmill Basin). Sheep use would be eliminated from Rockies and Trachyte Allotments to avoid conflicts with bighorn sheep. Active preference would be reduced on 13 other allotments. The elimination would affect nine permittees by eliminating most of their summer operations. Most active preference increases would occur on winter ranges.

Reductions in active preference would occur as follows on 13 other allotments:

| Allotment | Reduction (AUMs) | Percent of Active Preference |
|---|---|---|
| Blue Bench | 1,861 | 40 |
| Bullfrog | 90 | 2 |
| Burr Point | 2,933 | 66 |
| Cathedral | 632 | 26 |
| Cedar Point | 863 | 45 |
| Hartnet | 54 | 5 |
| North Bench | 150 | 32 |
| Rockies | 3,014 | 48 |
| Sandy 1 | 112 | 11 |
| Sandy 2 | 1,527 | 68 |
| Steele Butte | 3,172 | 63 |
| Trachyte | 1,875 | 65 |

In addition to the changes mentioned above, the nine permittees whose active preference would be eliminated would also be affected by reductions on other allotments. Altogether, 43 permittees would be given reductions. Eight permittees would be allowed to graze their livestock at above active preference on the three allotments (Robbers Roost, Sewing Machine, and Waterpocket) where grazing would increase above active preference. Active preference on three allotments would not change, affecting seven permittees; one permittee would receive an increase on one allotment and decreases on other allotments.

### COMPARISON OF ALTERNATIVE LIVESTOCK USE AND AVERAGE USE

In addition to the four allotments (Crescent Creek, Nasty Flat, Pennell, and Sawmill Basin) on which grazing would be eliminated, three other allotments (Rockies, Sandy 2, and Trachyte) would be stocked at levels lower than average licensed use. Nine more permittees would be involved in reductions in average use. Grazing use on eight allotments (Blue Bench, Hanksville, North Bench, Robbers Roost, Sewing Machine, Steele Butte, Waterpocket, and Wild Horse) would exceed average use.

### LAND TREATMENTS

Land treatments are proposed on nine allotments (see Table 2-4), including the four on which livestock grazing would be eliminated. The following compares initial AUM reductions with predicted long-term AUM increases resulting from land treatments.

| Allotment | Initial Reduction (AUMs) | Long-Term Restoration (AUMs) |
|---|---|---|
| Bullfrog | 90 | 80 |
| Rockies | 3,014 | 103 |
| Sandy 2 | 1,527 | 50 |
| Steele Butte | 3,172 | 160 |
| Trachyte | 1,875 | 25 |

These increases would benefit the affected permittees in the long-term, resulting in a 1-percent increase above the alternative's initial reductions.

## Alternative D: Optimize Livestock

This alternative proposes to eliminate bison use and limit other big game use to levels compatible with 59,528 AUMs for livestock (46,677 AUMs for cattle and 12,851 AUMs for sheep).

### COMPARISON OF ALTERNATIVE USE AND AVERAGE USE

Livestock grazing at the alternative level would be less than average licensed use on five allotments. Reductions in use on these allotments would affect 15 permittees. The reduction in use levels would be as follows:

| Allotment | Reduction in AUMs | Percent of Reduction |
|---|---|---|
| Crescent Creek | 130 | 38 |
| Sandy 1 | 72 | 9 |
| Sandy 2 | 624 | 41 |
| Steele Butte | 44 | 2 |
| Trachyte | 54 | 4 |


## COMPARISON OF ALTERNATIVE USE AND ACTIVE PREFERENCE

Active preference would be reduced on 13 allotments, affecting 38 permittees, as follows:

| Allotment | Active Preference Reduction (AUMs) | Percent of Reduction |
|---|---|---|
| Blue Bench | 1,842 | 40 |
| Cathedral | 632 | 25 |
| Cedar Point | 558 | 29 |
| Crescent Creek | 127 | 38 |
| Hartnet | 54 | 5 |
| North Bench | 150 | 32 |
| Sandy 2 | 1,343 | 60 |
| Sawmill Basin | 13 | 7 |
| Steele Butte | 3,012 | 59 |
| Trachyte | 1,044 | 49 |

Only cattle are involved in reductions on the following allotments.

| Allotment | Active Preference Reduction (AUMs) | Percent of Reduction |
|---|---|---|
| Bullfrog | 928 | 29 |
| Rockies | 1,875 | 33 |
| Sandy 1 | 271 | 29 |

Forage use levels under this alternative would exceed active preference levels on the following eight allotments:

| Allotment | Increase (AUMs) | Percent of Increase |
|---|---|---|
| Burr Point | 2,179 | 49 |
| Hanksville | 4,679 | 77 |
| Nasty Flat | 474 | 100 |
| Pennell | 1,105 | 42 |
| Robbers Roost | 1,614 | 30 |
| Sewing Machine | 1,081 | 67 |
| Waterpocket | 514 | 16 |
| Wild Horse | 428 | 40 |

Only sheep are involved in increases on the following allotments.

| Allotment | Increase (AUMs) | Percent of Increase |
|---|---|---|
| Bullfrog | 980 | 304 |
| Rockies | 2,383 | 876 |
| Sandy 1 | 159 | 311 |
| Trachyte | 710 | 93 |

In addition to the increases above, 1,500 AUMs would be provided for livestock use from the Dry Lake, Flint Trail, and Little Rockies unallotted areas.

These increases would affect 29 permittees. Eight of these permittees would have received reductions on other allotments. Consequently, 21 permittees would receive active preference increases, 30 permittees would receive reductions, and eight permittees would receive both increases and decreases on different allotments.

## COMPARISON OF SHEEP AND CATTLE USE

An important consideration in this alternative is the increase in sheep use, which is proposed to increase more than cattle use. The average use for sheep is

301 AUMs (only four of the eight allotments with sheep permits have been used by sheep in the last 5 years). The active preference is for 5,589 AUMs.

### LONG-TERM AUM CHANGES FROM LAND TREATMENTS

As described in Alternative C, land treatments would occur on nine allotments. The following compares initial reductions proposed for five allotments to present active preference and predicts long-term increases resulting from land treatments.

| Allotment | Initial Reduction (AUMs) | Long-Term Restoration (AUMs) |
|---|---|---|
| Crescent Creek | 127 | 400 |
| Sandy 2 | 1,343 | 150 |
| Sawmill Basin | 13 | 150 |
| Steele Butte | 3,012 | 480 |
| Trachyte | 1,044 | 75 |

Even with additional AUMs from land treatments, active preference would still not be reached.

## Alternative E: Preferred Alternative—Planning Recommendation

Livestock grazing at the proposed level (50,485 AUMs) would be 189 percent of average use (26,631 AUMs) and 89 percent of active preference (56,285 AUMs).

### COMPARISON OF ALTERNATIVE USE TO AVERAGE USE

On Burr Point and Sandy 1, sheep use would be increased above average licensed use. The following allotments would be reduced below average licensed use:

| Allotment | Adjustment Below Average Use (AUMs) | Percent Reduction |
|---|---|---|
| Burr Point | 246 | 18 |
| Crescent Creek | 148 | 44 |
| Nasty Flat | 37 | 8 |
| Sandy 1 | 72 | 10 |
| Sandy 2 | 802 | 53 |
| Steele Butte | 192 | 9 |

Those reductions to average licensed use would affect 22 permittees while 37 permittees would receive increases in average licensed use.

### COMPARISON OF ALTERNATIVE USE TO ACTIVE PREFERENCE

In addition to the reductions for the six allotments mentioned above, 12 other allotments would not reach active preference:

| Allotment | Adjustments Below Active Preference (AUMs) | Percent of Active Preference |
|---|---|---|
| Blue Bench | 1,845 | 40 |
| Burr Point | 2,152 | 48 |
| Cathedral | 632 | 25 |
| Cedar Point | 619 | 32 |
| Crescent Creek | 145 | 43 |
| Hartnet | 54 | 5 |
| Nasty Flat | 75 | 15 |
| North Bench | 150 | 32 |
| Sandy 1 | 271 | 29 |
| Sandy 2 | 1,521 | 68 |
| Sawmill Basin | 70 | 42 |
| Steele Butte | 3,160 | 62 |

Only cattle are involved in reductions on the following allotments.

| Allotment | Adjustments Below Active Preference (AUMs) | Percent of Active Preference |
|---|---|---|
| Bullfrog | 764 | 24 |
| Pennell | 90 | 3 |
| Rockies | 1,612 | 20 |
| Trachyte | 946 | 44 |

The ten allotments listed below would have increases in stocking:

| Allotment | Active Preference Increase (AUMs) | Percent of Increase |
|---|---|---|
| Hanksville | 4,215 | 70 |
| Robbers Roost | 1,152 | 22 |
| Sandy 1 | 159 | 312 |
| Sewing Machine | 1,046 | 65 |
| Waterpocket | 243 | 8 |
| Wild Horse | 424 | 40 |

Only sheep active preference would increase on the following allotments.

| Allotment | Active Preference Increase (AUMs) | Percent of Increase |
|---|---|---|
| Bullfrog | 357 | 111 |
| Pennell | 57 | 33 |
| Rockies | 603 | 222 |
| Trachyte | 57 | 8 |

Reductions in active preference would affect 40 permittees. Increases to active preference would affect 14 permittees, and five permittees would receive increases on some allotments and decreases on others.

### LONG-TERM AUM CHANGES FROM LAND TREATMENTS

Land treatments would occur on nine allotments (see Table 3-3). The following compares initial AUM reductions in active preference and predicted long-term increases resulting from land treatments.

| Allotment | Initial Reduction (AUMs) | Long-Term Restoration (AUMs) |
|---|---|---|
| Crescent Creek | 145 | 240 |
| Nasty Flat | 75 | 224 |
| Rockies | 1,612 | 306 |
| Sandy 2 | 1,521 | 150 |
| Sawmill Basin | 70 | 110 |
| Steele Butte | 3,160 | 480 |
| Trachyte | 946 | 75 |

The livestock use and additional AUMs given to permittees on these seven allotments would still be short of active preference.

On Bullfrog (3,442 AUMs active preference) and Pennell (2,594 AUMs active preference), increases of 250 and 600 AUMs, respectively, would result from land treatments in the long term. This increase would be 4 percent of the alternative forage use.

## Conclusion

Table 4-16 summarizes the livestock forage use and changes in active preference. Alternative A would have the greatest active preference reduction. Alternative D would result in the greatest benefit to permittees, with the greatest advantage to permittees having sheep. When considering multiple-use management, Alternative E would provide a relatively high benefit to livestock permittees.

Alternatives A and B would both result in overgrazing. Overgrazing is incompatible with BLM objectives and could not be allowed.

Grazing at about the indicated grazing capacity in the short term would provide long-term benefits to livestock production; overgrazing in the short term would be expected to result in declining livestock production.

# SOCIOECONOMICS

This analysis will include impacts to ranch income and capital, regional economic impacts, and attitudes and expectations. Although this analysis quantifies economic impacts to the average ranch in each category, actual impacts on individual ranchers may not be reflected. Changes in net ranch income were calculated using a linear programming model and partial budget adapted from Jacobsen (1981).

Wayne, Sevier, and Garfield Counties constitute the impact region. Because of their interrelationships and the availability of data, the regional impacts will be analyzed on this three-county level. Changes in the number of AUMs could impact ranch capital by means of the "market value" of the permit.

The regional economy (Wayne, Garfield, and Sevier Counties) would also be impacted by changes in livestock grazing. Estimates of the magnitudes of these impacts were made using the U.S. Forest Service IMPLAN Economic Model. For the purpose of regional analysis, all AUMs allotted, including those allotted for sheep use, are included and assumed to be used. While the magnitude of the figures representing regional impacts is small, it should be kept in mind that the region is considerably larger than the planning area. Therefore, these figures should be used for comparison between alternatives and should not be taken at face value.

## Alternative A: Proposed Action—No Change

Table 4-18 summarizes the economic impacts to the various ranch categories resulting from the proposed grazing levels. There would be no predictable change to net ranch income because the average level of use, as defined by this alternative, is used as the baseline, and permittees would be allowed to graze their livestock at this level. However, ranching operations would be impacted by significant reductions in their permits. These reductions would affect ranch capital values as shown in Table 4-18 and are the largest reductions in capital value among the alternatives analyzed.

TABLE 4-16

Summary of Forage Use

| | Existing Situation | Alternatives | | | | |
|---|---|---|---|---|---|---|
| | | A | B | C | D | E |
| No. of Permittees Affected By: | 59 | | | | | |
| Reductions | | 59 | 1 | 43 | 21 | 40 |
| Increase | | 0 | 0 | 8 | 30 | 14 |
| No Change | | 0 | 57 | 7 | 0 | 0 |
| Increases and Decreases | | 0 | 1 | 1 | 8 | 5 |
| Cattle Use (AUMs) | 50,696 | 26,330 | 50,696 | 35,722 | 46,659 | 42,006 |
| Sheep Use (AUMs) | 5,589 | 301 | 5,589 | 4,082 | 12,869 | 8,481 |
| Total Livestock Use (AUMs) | 56,285 | 26,631 | 56,285 | 39,804 | 59,528 | 50,487 |
| Percent of Active Preference | 100 | 47 | 100 | 73 | 117 | 93 |

Source: USDI, BLM, 1982.

[a]Increases and decreases on different allotments.

TABLE 4-17

Changes in AUMs By Average Size Category of Cattle Permittees

| | Average Small Permittees (AUMs) | Average Medium Permittees (AUMs) | Average Large Permittees (AUMs) |
|---|---|---|---|
| Existing Use | 179 | 623 | 1,238 |
| Alternative A (average licensed use) | 179 | 623 | 1,238 |
| Alternative B (active preference) | 332 | 1,184 | 2,298 |
| Alternative C (big game) | 206 | 733 | 1,489 |
| Alternative D (livestock) | 216 | 931 | 1,907 |
| Alternative E (multiple use) | 217 | 850 | 1,763 |

Source: USDI, BLM, 1982.

TABLE 4-18

Alternative A: Changes in Ranch Income and Capital

| Permittees | Average Net Ranch Income[a] | Percent Change From Average Net Ranch Income | Percent Change in BLM Permits and Capital Value[b] |
|---|---|---|---|
| Cattle Permittees | | | |
| Small (1-99 cows) | $ 6,756 | -- | -55 |
| Medium (100-199 cows) | 9,959 | -- | -60 |
| Large (200+ cows) | 40,057 | -- | -51 |

[a]Computed based on this alternative.

[b]Change in AUMs that would be allotted and their capital value.

TABLE 4-19

Alterntive B: Changes in Ranch Income and Capital

| Permittees | Net Ranch Income | Percent Change From Average Net Ranch Income | Percent Change in BLM Permits and Capital Value[a] |
|---|---|---|---|
| Cattle Permittees | | | |
| Small (1-99) | $ 8,679 | +28 | -- |
| Medium (100-199) | 15,762 | +58 | -- |
| Large (200+) | 55,287 | +38 | -- |

[a]Change in AUMs that would be allotted and their capital value.

TABLE 4-20

Alternative B: Long-Term Regional Economic Impacts

| | Value and Percent Change From Existing Level | | |
|---|---|---|---|
| Regional Impacts | Total Gross Output[a] | Labor | Income[b] |
| Livestock Grazing | +1.4 | +0.9 | +0.8 |

Source: USDA, Forest Service, IMPLAN, BLM data, 1982.

[a]The total sales of each sector within the region; includes sales to consumers within the region and sales to industries and consumers outside the region (exports).

[b]Income earned by all households within the region (salaries, wages, profits, rents, royalties, interest, etc.).

The average small cattle ranch shows a loss of 183 AUMs for active preference or approximately $3,660; the medium-sized ranch shows a loss of 712 AUMs or $14,240; and the average large ranch is estimated to lose 1,177 AUMs or about $23,540 in capital value.

Because this alternative represents a baseline, no regional economic impacts are projected from changes in livestock grazing or big game hunting.

## Alternative B: No Action

Table 4-19 summarizes the economic impacts to the various ranch categories caused by the proposed grazing levels. The medium category of cattle permittees would experience the largest percentage change, with a 58-percent increase in net ranch income (about $5,803). However, in terms of dollar value, the large permittees would have the greatest increase, about $15,230, with small ranch income increasing by $1,922. These ranch income increases are the largest of any of the alternatives analyzed.

The capital value of permits would remain unchanged because the present active preference would be maintained.

Regional impacts caused by changes in the livestock industry under Alternative B result in the largest impacts of the alternatives analyzed (see Table 4-20).

Sales generated by hunting would be reduced as hunter days in the planning area declined. This would be especially true of bison hunting because there is no other place in the State of Utah to hunt bison. Deer hunters could hunt in other regions throughout the State, possibly reducing local revenues generated by this activity.

## Alternative C: Optimize Big Game

Table 4-21 summarizes the economic impacts from changed grazing levels to the various ranch categories.

Under this alternative, the medium cattle permittee would experience the most significant economic impact, with a 20-percent ($2,013) increase in net ranch income. The large and small categories are projected to show income increases of 16 percent ($6,379) and 11 percent ($767), respectively.

Reductions in permit size/capital value range from 684 AUMs ($13,680) for the large category ranch, to 110 AUMs ($2,200) for the small category ranch, with the medium category ranch losing 465 AUMs or $9,300.

Regional impacts caused by changes in the livestock industry show slight increases in all three indicators (see Table 4-22).

The projected increase of 122 bison hunters would increase sales generated by this activity by 104 percent, while increases in other big game hunting (deer, antelope, and bighorn sheep) would generate additional sales of about 391 percent in the long term.

## Alternative D: Optimize Livestock

Table 4-23 summarizes the economic impacts from changed grazing levels to the various ranch categories. This alternative produced changes in net ranch income as follows: large, /41 percent ($16,279); medium, /46 percent ($4,597); and small, /21 percent ($1,450). It would cause the least impact to the capital value of the permits in all three categories, with the large cattle permittee showing an increase of 81 AUMs above active preference.

This alternative has positive impacts on the regional economy which are very similar to Alternative B, as shown in Table 4-24. However, the projected elimination of bison would cause a 100-percent reduction in sales generated by bison hunting.

## Alternative E: Preferred Alternative—Planning Recommendation

Table 4-25 summarizes the economic impacts from changed grazing levels to the various ranch categories. This alternative would produce the following increases in net ranch incomes: the large category would increase by about 31 percent ($12,526); medium about 37 percent ($3,667); and small by 15 percent ($1,019). The decreases in capital values are as follows: large, $4,180; medium, $5,240; and small, $1,720.

Regional impacts caused by changes in the livestock industry are presented in Table 4-26. These impacts are positive and close in magnitude to those projected for Alternatives B, D, and E. However, this alternative would reduce local revenue from bison hunting by about 30 percent and increase other big game revenue by 93 percent.

## Conclusion

In terms of overall percentage changes in capital value and net ranch income, Alternative B is the most favorable of the alternatives considered. However, it must be acknowledged that, in the long term, the resultant overgrazing would cause adverse economic impacts. Alternative D is the next most favorable to ranching operations with Alternative E a very close third.

Considering the regional economy, Alternative B also has the greatest positive impact. This is mostly

TABLE 4-21

Alternative C: Changes in Ranch Income and Capital

| Permittees | Net Ranch Income | Percent Change From Average Net Ranch Income | Percent Change in BLM Permits and Capital Value[a] |
|---|---|---|---|
| Cattle Permittees | | | |
| Small (1-99) | $ 7,523 | +11 | -33 |
| Medium (100-199) | 11,972 | +20 | -39 |
| Large (200+) | 46,436 | +16 | -30 |

Source: USDI, BLM, 1982.

[a]Change in AUMs that would be allotted and their capital value.

TABLE 4-22

Alternative C: Regional Economic Impacts

| Regional Impacts | Percent Change From Existing Level | | |
|---|---|---|---|
| | Total Gross Output[a] | Labor | Income[b] |
| Livestock Grazing | +0.7 | +0.5 | +0.4 |

Source: USDA, Forest Service, IMPLAN, BLM data, 1982.

[a]The total sales of each sector within the region; includes sales to consumers within the region and sales to industries and consumers outside the region (exports).

[b]Income earned by all households within the region (salaries, wages, profits, rents, royalties, interest, etc.).

TABLE 4-23

Alternative D: Changes in Ranch Income and Capital

| Permittees | Net Ranch Income | Percent Change From Average Net Ranch Income | Percent Change in BLM Permits and Capital Value[a] |
|---|---|---|---|
| Cattle Permittees | | | |
| Small (1-99) | $ 8,206 | +21 | -14 |
| Medium (100-199) | 14,556 | +46 | -13 |
| Large (200+) | 56,335 | +41 | + 4 |

Source: USDI, BLM, 1982.

[a]Change in AUMs that would be allotted and their capital value.

TABLE 4-24

Alternative D: Regional Economic Impacts

| Regional Impacts | Percent Change From Existing Level | | |
|---|---|---|---|
| | Total Gross Output[a] | Labor | Income[b] |
| Livestock Grazing | +1.4 | +0.8 | +0.8 |

Source: USDA, Forest Service, IMPLAN, BLM data, 1982.

[a]The total sales of each sector within the region; includes sales to consumers within the region and sales to industries and consumers outside the region (exports).

[b]Income earned by all households within the region (salaries, wages, profits, rents, royalties, interest, etc.).

TABLE 4-25

Alternative E: Changes in Ranch Income and Capital

| Permittees | Net Ranch Income | Percent Change From Average Net Ranch Income | Percent Change in BLM Permits and Capital Value[a] |
|---|---|---|---|
| Cattle Permittees | | | |
| Small (1-99) | $ 7,775 | +15 | -26 |
| Medium (100-199) | 13,626 | +37 | -22 |
| Large (200+) | 52,583 | +31 | - 9 |

Source: USDI, BLM, 1982.

[a]Change in AUMs that would be allotted and their capital value.

TABLE 4-26

Alternative E: Regional Economic Impacts

| | Percent Change From Existing Level | | |
|---|---|---|---|
| Regional Impacts | Total Gross Output[a] | Labor | Income[b] |
| Livestock Grazing | +1.1 | +0.6 | +0.6 |

Source: USDA, Forest Service, IMPLAN, BLM data, 1982.

[a]The total sales of each sector within the region; includes sales to consumers within the region and sales to industries and consumers outside the region (exports).

[b]Income earned by all households within the region (salaries, wages, profits, rents, royalties, interest, etc.).

because of the large forage use level for sheep, which was included in the regional analysis. Alternative C would have the smallest impact on the regional economy (increases in total gross output, total income, and employment each less than 1 percent), with Alternatives B and E having very similar positive impacts.

### Attitudes and Lifestyles

#### ALTERNATIVE A: PROPOSED ACTION—NO CHANGE

In the short and long terms, some livestock permittees would feel that big game numbers, particularly bison, should be reduced. Conversely, recreationist and conservation groups would generally resent the limiting of big game. In addition, conservation groups would contest continued grazing management as unplanned use of public lands.

#### ALTERNATIVE B: NO CHANGE

The effects of Alternative B would be the same as Alternative A.

#### ALTERNATIVE C: OPTIMIZE BIG GAME

In the short and long terms, livestock permittees would resent priority forage use for big game. Permittees would take particular exception to the replacement of livestock forage use by bison on four allotments. Livestock permittees would resent the decline in ranching lifestyle because of diminished operations.

#### ALTERNATIVE D: OPTIMIZE LIVESTOCK

In the short and long terms, miners and conservation groups would resent priority forage use by livestock. The elimination of all bison AUMs would be particularly contested. In addition, conservation groups would believe that planning area scenic and recreational values would be diminished.

#### ALTERNATIVE E: PREFERRED ALTERNATIVE—PLANNING RECOMMENDATION

In the short and long terms, some livestock permittees would feel that bison numbers should be reduced.

### Conclusion

Livestock permittees, recreationists, and conservation groups would probably perceive Alternatives A and B as being essentially the same program. Livestock permittees would feel that big game numbers should be reduced, but recreationist and conservation groups would resent the limiting of big game numbers. Conservation groups would consider both alternatives as unplanned use of public lands. Livestock permittees would resent Alternative C the most. Conversely, recreationist and conservation groups would resent Alternative D the most. Alternative E would be perceived as the most balanced use of public lands by all user groups.

## ENERGY REQUIREMENTS

Because no new rangeland improvements are proposed under Alternatives A and B, the only energy required would be for maintenance of existing administrative facilities and vehicles and operation of equipment during maintenance of existing rangeland developments. Under Alternatives C, D, and E, construction of rangeland improvements would require equal expenditures of energy.

Specific types of land treatments have not been specified. The treatment used would determine energy requirements. Generally, burning and spraying require significantly less energy than chaining. The selection of methods for land treatments is the only significant means to conserve energy. The energy required for implementation of the selected alternative would constitute a very small part of total annual private, commercial, and industrial use in the planning area.

## SUMMARY OF UNAVOIDABLE ADVERSE IMPACTS, IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES, AND THE RELATIONSHIP OF SHORT-TERM USE OF THE ENVIRONMENT TO MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Impacts (beneficial and adverse) discussed in the preceding sections of Chapter 4 are compared by environmental element and by alternative in a summary at the end of Chapter 2 (Table 2-5). Impacts of low significance or those of only short duration are not considered. The relationship between short-term uses of the environment to maintenance and enhancement of long-term productivity is also discussed for each resource by alternative in Table 2-5.

Unavoidable adverse impacts identified throughout Chapter 4 are summarized as follows:

## Vegetation

The loss of forage production, with a resultant decline in ecological condition and a possible reduction in rangeland site potential, could occur on 18 percent of the planning area under Alternative A and on 56 percent of the area under Alternative B. The severity of these impacts would increase with time. No unavoidable adverse impacts to vegetation are expected under Alternatives C, D, or E.

## Soils

Increased erosion could occur on portions of 12 allotments under Alternative A and on portions of 22 allotments under Alternative B. These are the same areas on which vegetation would be most severely impacted. Except for temporary localized soil loss, there would be no unavoidable adverse impacts to soil under Alternatives C, D, and E.

## Wildlife

Unless there were significant changes in livestock grazing practices (i.e., distribution, periods of use, kinds of livestock grazed), big game populations would remain far below their biotic potential under Alternatives A, B, D, and E. Alternative C would not provide sufficient high quality useable forage to enable big game numbers to increase. Only bison and bighorn sheep would meet UDWR's long-term management goals.

## Visual Resources

Overgrazing in highly scenic, visually sensitive areas could adversely affect visual resources on 5 percent of the planning area under Alternative A and 47 percent of the planning area under Alternative B. Under Alternatives C, D, and E, rangeland improvements on 17 allotments could violate VRM management class objectives.

## Wilderness

The effects of overgrazing could gradually become more apparent and violate BLM IMP non-impairment criteria in two WSAs under Alternative A and five WSAs under Alternative B. Overgrazing would continue on one allotment, affecting one WSA under Alternatives C and E. Because construction of proposed rangeland improvements must meet BLM IMP criteria, no other unavoidable impacts to WSAs would occur under Alternatives C, D, or E.

## Recreation

Overutilization caused by overgrazing would adversely affect primitive and sightseeing values on four allotments and one developed campground under Alternative A. Under Alternative B, progressive degradation of sightseeing, big game hunting, and primitive values would adversely affect 12 allotments including one unfenced, developed campground. Rangeland improvements on 17 allotments would affect sightseeing and primitive values under Alternatives C, D, and E. Hunting and sightseeing values would be most improved under Alternatives C and E, with Alternative D causing the most adverse impacts to hunting.

## Cultural Resources

Ground disturbance during construction of rangeland improvements under Alternatives C, D, and E could inadvertently destroy or damage cultural resources. This would result in loss of scientific and educational information.

## Livestock Grazing

Permittees would sustain the most reductions under Alternative A, while there would be no reductions under Alternative B. In addition, there would be decreases in livestock productivity in the long term under Alternatives A and B. Nine permittees would lose their active preference and 34 permittees would receive active preference reductions under Alternative C. Active preference reductions would affect 29 permittees and 40 permittees under Alternatives D and E, respectively.

## Socioeconomics

Reductions of permits would cause proportionate reductions in capital values of affected ranches under Alternatives A and B. Under Alternatives C, D, and E, reductions that actually caused a permittee to cut the number of livestock grazed on an allotment would result in lost income. All alternatives except C would result in reduced big game numbers, therefore lowering income to the local economy from hunters.

# APPENDIX 1

CULTURAL RESOURCES
MEMORANDUM OF UNDERSTANDING
HENRY MOUNTAIN GRAZING MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT
BETWEEN
THE BUREAU OF LAND MANAGEMENT
AND
THE UTAH STATE HISTORIC PRESERVATION OFFICER

## I. PURPOSE

The Bureau of Land Management, hereinafter referred to as the Bureau, is preparing the Henry Mountain Grazing Management Environmental Impact Statement (Henry Mountain EIS) under the provisions of the National Environmental Policy Act of 1969. The Bureau has determined that cultural values could be damaged or lost as a result of actions proposed in the Henry Mountain EIS. The following kinds of actions are proposed on public lands administered by the Bureau:

a. Pipeline construction
b. Reservoir construction
c. Fenceline construction
d. Vegetation Modification (e.g., chaining)
e. Water development and well construction

The Bureau has the responsibility to protect the cultural values on the lands administered by the Bureau. The Utah State Historic Preservation Office, hereinafter referred to as the State, is available to assist and advise those working with these federal regulations. In this MOU, "cultural resources" means data and sites which have archaeological, historical, architectural, or cultural importance and interest.

The Bureau requires investigators to be qualified to evaluate these "cultural resources".

## II. AUTHORITY

This MOU is authorized under the Federal Land Policy and Management Act of 1976 and the National Historic Preservation Act of 1966. It is in accord with Bureau policies and programs.

## III. RESPONSIBILITIES AND PROCEDURES

The Bureau complies with 36 CFR 800 in identifying sites which are listed in or eligible for inclusion in the National Register of Historic Places.

A. As part of the planning and environmental analysis required prior to major grazing management decisions, the Bureau will search for archaeological and historical literature concerning the Henry Mountain area. Literature and records searches have been conducted for all public lands that would be affected by the Henry Mountain proposal.

B. After completing the planning and environmental analysis process, should the proposed management be implemented, the Bureau will inform project participants of, monitor compliance with, and enforce the following stipulations:

1. Prior to initiation of ground-disturbing activities, literature searches and intensive surveys will be undertaken on all areas which would be disturbed.

2. Wherever possible and feasible, cultural resources will be avoided by construction and related activities. This will be accomplished mainly by regulating vegetation modification activities and adjusting the location of other facilities such as pipelines and fences. Significant cultural resources facing inundation due to proposed reservoir construction will be salvaged to recover data that would otherwise be lost.

3. A professional archaeologist may be required to be present when ground-disturbing operations are underway.

4. Subsurface cultural resources that are encountered during any construction will be salvaged if there is no other recourse in such a situation.

C. Wherever it is not possible and feasible to avoid sites that contain cultural values, the Bureau will consult with the State to determine the most satisfactory means of mitigating damage, as required by 36 CFR 800.

D. The Bureau will provide cultural resource reports, technical reports, and other pertinent material to the State so that the State can maintain a central depository of reports which will insure that no duplication will be required by the Bureau in the future.

IV. IMPLEMENTATION

A. This MOU will become effective on the date of the last signature on this MOU.

B. Either party may request revision or cancellation of this agreement by written notice, not less than 30 days prior to the time when such action is proposed.

C. Any problems resulting from this agreement which cannot be resolved by the Bureau in consultation with the State will be referred to the Secretary of the Interior and the Advisory Council on Historic Preservation for resolution.

D. Nothing in this MOU should be construed as the State requiring compliance with federal regulations. The purpose of this MOU is to make the State aware of current federal procedures and regulations. These procedures will also allow copies of reports to be made available for central filing, so work is not unnecessarily duplicated.

2/5/82
Date

Utah State Director
Bureau of Land Management
Department of the Interior

2-5-82
Date

Utah State Historic Preservation Officer

# APPENDIX 2

Summary of Vegetation Trend, Utilization, and Diet Data

This appendix, which is the basis for Table 3-3, summarizes vegetation trend, utilization, and diet data. It is divided into two sections. Section one lists plant species used as key species within each allotment. Section two includes the rationale used in developing diets and forage use levels.

## Key Plant Species

Plant species used as key or index species within each allotment in areas key to livestock grazing are listed in the table below. The plant species used in deriving trend indexes and for purposes of determining forage utilization are identified as an "a". These species fit the criteria generally used in defining key species (BLM Manual 4412 (SRM, 1974).

In addition to key plant species, records of other indicator species were recorded during the soil-vegetation inventory. Changes in the amounts of cheatgrass, Russian thistle, snakeweed, big sagebrush, blue grama, loco weed, lupine, etc., plants were recorded and used as a basis for assessing trend.

Index of Key and Indicator Species[a]

| Plant Symbol | Scientific Name | Common Name | Growth Form |
|---|---|---|---|
| Agcr | Agropyron cristatum | Crested wheatgrass | PIG |
| Agda | Agropyron dasystachyum | Thickspike wheatgrass | PNG |
| Adge2 | Agropyron desertorum | Standard crested wheatgrass | PIG |
| Agin | Agropyron inerme | Beardless bluebunch wheatgrass | PNG |
| Agin2 | Agropyron intermedium | Intermediate wheatgrass | PIG |
| Agsm | Agropyron smithii | Western wheatgrass | PNG |
| Agsp | Agropyron spicatum | Bluebunch wheatgrass | PNG |
| Amela | Amelanchier spp. | Serviceberry | NS |
| Amal2 | Amelanchier alnifolia | Saskutoon serviceberry | NS |
| Amut | Amelanchier utahensis | Utah serviceberry | NS |
| Arlo3 | Aristida longiseta | Red threeawn | PNG |
| Artem | Artemesia spp. | Sagebrush | NS |
| Arar8 | Artemesia arbuscula | Low sagebrush | NS |
| Ararn | Artemesia arbuscula nova | Black sagebrush | NS |
| Arbi | Artemesia biglovii | Bigelow sagebrush | NS |
| Arfi2 | Artemesia filifolia | Sand sagebrush | NS |
| Arfr 4 | Artemesia frigida | Fringed sagewort | NHS |
| Artr2 | Artemesia tridentata | Big sagebrush | NS |
| Astra | Astragalus spp. | Locoweed | PNF |
| Atrip | Atriplex spp. | Saltbush | NS |
| Atca2 | Atriplex canescens | Fourwing saltbrush | NS |
| Atco | Atriplex confertifolia | Shadscale | NS |
| Atco4 | Atriplex corrugata | Mat saltbrush | NHS |
| Atnu2 | Atriplex nuttalii | Nuttall saltbush | NHS |
| Atnuc | Atriplex nuttalii cuneata | Wedgeleaf nuttall saltbush | NHS |
| Bogr2 | Bouteloua gracilis | Blue grama | PNG |
| Boer4 | Bouteloua eriopoda | Black grama | PNG |

## APPENDIX 2

| Plant Symbol | Scientific Name | Common Name | Growth Form |
|---|---|---|---|
| Brin2 | Bromus inermis | Smooth Brome | PIG |
| Brte | Bromus tectorum | Cheatgrass | AIG |
| Carex | Carex spp. | Sedge | PNGL |
| Cele3 | Cercocarpus ledifolius | Curlleaf mountain mahogany | NS |
| Celei2 | Cercocarpus ledifolius intricatus | Littleleaf mountain mahogany | NS |
| Cemo2 | Cercocarpus montanus | Birchleaf mountain mahogany | NS |
| Cheno | Chenopodium spp. | Goosefoot | ANF & AIF |
| Chna2 | Chrysothamnus nauseosus | Rubber rabbitbrush | NS |
| Chvis8 | Chrysothamnus viscidiflorus | Douglas rabbitbrush | NS |
| Chvis | Chrysothamnus viscidiflorus stenophyllus | Small rabbitbrush | NS |
| Comes | Cowania mexicana stansburiana | Stansbury cliffrose | NS |
| Cora | Colegyne ramosissima | Blackbrush | NS |
| Dagl | Dactylis glomerata | Orchardgrass | PIG |
| Ephed | Ephedra spp. | Mormon tea | PNS |
| Epne | Ephedra nevadensis | Nevada Mormon tea | PNS |
| Epto | Ephedra torreyana | Torrey Mormon tea | PNS |
| Epvi | Ephedra viridis | Green Mormon tea | PNS |
| Eula5 | Eurotia lanata | Winterfat | NHS |
| Feoc2 | Festuca octoflora | Sixweeks fescue | ANG |
| Feov | Festuca ovina | Sheep fescue | PNG |
| Gusa2 | Gutierrezia sarothrae | Broom, snakeweed | NHS |
| Hija | Hilaria jamesii | Galleta (curlygrass) | PNG |
| Heki | Hesperochloa kingii | Spike fescue | PNG |
| Lupin | Lupinus spp. | Lupine | PNF |
| Luca | Lupinus caudatus | Tailcup lupine | PNF |
| Mesa | Medicago sativa | Alfalfa | PIF |
| Opunt | Opuntia spp. | Pricklypear | NS4S |
| Orhy | Oryzopsis hymenoides | Indian ricegrass | PNG |
| Oxytr | Oxytropis spp. | Crazyweed | PNF |
| Poa++ | Poa spp. | Bluegrass | PNG |
| Pofe | Poa fendleriana | Muttongrass | PNG |
| Popr | Poa pratensis | Kentucky bluegrass | PIG |
| Pose | Poa secunda | Sandberg bluegrass | PNG |
| Putr2 | Purshia tridentata | Antelope bitterbrush | NS |
| Sakat | Salsola kali var. tenufolia | Russian thistle | AIF |
| Sihy | Sitanion hystrix | Squirreltail | PNG |
| Sporo | Sporobolus spp. | Dropseed | PNG |
| Spai | Sporobolus airoides | Alkali sacaton | PNG |
| Spco4 | Sporobolus contractus | Spike dropseed | PNG |
| Spcr | Sporobolus cryptandrus | Sand dropseed | PNG |
| Stipa | Stipa spp. | Needlegrass | PNG |
| Stco4 | Stipa comata | Needle-and-thread grass | PNG |
| Stle | Stipa lettermani | Letterman needlegrass | PNG |

ANF Annual native forb
ANG Annual native grass
ANGL Annual native grasslike

| Plant Symbol | Scientific Name | Common Name | Growth Form |
|---|---|---|---|
| AIF | Annual introduced forb | | |
| PNF | Perennial native forb | | |
| PNG | Perennial native grass | | |
| PNGL | Perennial native grasslike | | |
| PIF | Perennial introduced forb | | |
| PIG | Perennial introduced grass | | |
| NFH | Native Half shrub | | |
| NS | Native shrub | | |
| NS4S | Native succulent shrub | | |

[a]Symbols and scientific names are from the USDA, Soil Conservation Service (1978).

## Diets and Forage Use Levels

This section includes Staff Reports that (a) outline the rationale and procedures used in estimating forage production; and (b) explain the development and use of diets used to assign available forage to different kinds of animals.

APPENDIX 2 (continued)

TABLE 1

Trend Studies

| Code No. | Allotment | Pasture and Plot No. | Years of Records | Index[a] or Key Species | Percent Utilization: Browse[b] 1 | Browse 2 | Browse 3 | Grass[b] 1 | Grass 2 | Grass 3 | Trend of Key[c]: Browse | Seedling | Grass: Cool | Grass: Warm | Apparent Condition and Trend[c]: Photo Trend | Condition[d] | Index | 1977[e] | Longtime Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0100 | Blue Bench | Oak O-1 | 69-80 | [a]Hija, [a]Atco, Atca2, Ephed | 70 | -- | -- | 17-68 | -- | 13 | ↑ | → | -- | ↓ | → | 4 | ↑ | S↑ | → |
| | | Oak O-2 | 69-80 | [a]Hija, Orhy, Spcr, Atco | 10 | -- | -- | 32-74 | -- | 19 | ↑ | ↑ | → | ↑ | ↑ | 3 | ↑ | S→ | ↑ |
| | | Coaly C-1 | 69-80 | [a]Hija, [a]Orhy, Atco, [a]Atco4 | 80 | 20-60 | -- | 17-84 | -- | -- | -- | ↑ | ↓ | → | ↑ | 3 | → | U↓ | → |
| | | Coaly C-2 | 69-80 | [a]Hija, Orhy, Spcr, [a]Atrip | -- | -- | -- | 72-83 | -- | -- | ↓ | ↑ | -- | ↓ | ↑ | 3 | → | S↑ | → |
| | | Points P-1 | 69-80 | [a]Hija, [a]Orhy, Spcr, [a]Ephed | 67 | -- | 35 | 17-83 | -- | 53-58 | ↓ | ↑ | ↓ | → | ↑ | 3 | ↓ | S↑ | → |
| | | Points P-2 | 69-80 | [a]Hija, [a]Orhy, Spcr, [a]Atco, Ephed | 60 | -- | 40 | 67-84 | -- | 31-51 | → | ↑ | ↓ | ↓ | ↑ | 3 | → | S↑ | → |
| | | Points P-3 | 72-80 | [a]Hija, [a]Orhy, Atnu, Atco | -- | -- | 20 | 80 | -- | -- | -- | ↑ | → | → | ↑ | 3 | ↑ | -- | ↑ |
| | | Points P-4 | 72-80 | [a]Hija, [a]Orhy, Spcr | -- | -- | -- | -- | -- | -- | -- | ↑ | ↓ | ↓ | ↘ | 4 | ↓ | -- | ↓ |
| 0101 | Bullfrog | Blue Hills BH-1 | 68-80 | [a]Hija, Orhy, Spcr | -- | -- | -- | 37-83 | -- | -- | -- | ↑ | -- | → | → | 3 | ↓ | U↑ | → |
| | | Hills BH-2 | 68-80 | [a]Hija, [a]Orhy, Spcr, Atca2 | -- | -- | 50-88 | -- | -- | -- | -- | ↑ | ↓ | ↑ | ↑ | 3 | ↑ | U↓ | ↑ |
| | | Hills BH-6 | 68-80 | [a]Hija2, Artr2, Gusa2 | -- | -- | -- | 34-75 | -- | -- | ↑ | ↑ | -- | ↓ | ↓ | 4 | ↓ | S↑ | ↓ |
| | | Hills BH-7 | 68-80 | [a]Hija, [a]Eula5, [a]Atco, Gusa2 | -- | -- | -- | 33-61 | -- | -- | ↑ | ↑ | -- | ↓ | ↓ | 4 | ↓ | S↑ | ↓ |
| | | Hills BH-8 | 68-80 | [a]Hija, [a]Atco | -- | -- | -- | -- | -- | -- | ↑ | ↑ | -- | ↑ | ↑ | 3 | ↑ | S↑ | ↑ |
| | | Clay Pt. CP-1 | 68-80 | [a]Hija, Orhy, Epne, [a]Atca2 | 36-64 | -- | 66 | 36-73 | -- | 10-16 | ↑ | → | -- | ↓ | → | 4 | ↓ | U↓ | → |
| | | Clay Pt. CP-2 | 68-80 | [a]Hija, [a]Orhy, [a]Epvi | 36 | -- | 60 | 40-67 | -- | 38 | ↑ | ↑ | ↑ | → | ↑ | 3 | ↑ | S↑ | ↑ |
| 0102 | Burr Point | West B-1 | 72-80 | [a]Hija, Orhy, Ephed, Gusa2 | -- | -- | 15-50 | -- | -- | 10-28 | -- | ↑ | -- | ↑ | → | 3 | ↑ | U↑ | ↑ |
| | | B-2 | 72-80 | [a]Hija, Orhy, Spcr, [a]Ephed | 30-40 | -- | 21-52 | 10-44 | -- | 10-38 | ↓ | → | -- | → | → | 4 | ↑ | U↑ | → |
| | | B-5 | 72-80 | [a]Orhy, [a]Arfi2 | -- | -- | 14 | -- | -- | 17-73 | ↑ | -- | ↑ | -- | → | 3 | ↑ | U↑ | → |
| | | East B-3 | 72-80 | [a]Orhy, Hija, [a]Ephed | -- | -- | 14-43 | -- | -- | 16-40 | ↑ | ↑ | → | -- | → | 3 | ↑ | U↓ | ↑ |
| | | B-4 | 72-80 | [a]Orhy, Hija, Spcr, Ephed, Atca2, Gusa2 | 54-70 | -- | 10-40 | 43-57 | -- | 10-20 | -- | → | → | -- | → | 4 | → | U↓ | → |
| | | B-6 | 72-80 | [a]Orhy, [a]Ephed, Hija, Spcr | 48 | -- | 41 | 52 | -- | 22-38 | ↑ | → | → | -- | → | 4 | ↑ | S↑ | → |
| | | B-7 | 73-80 | [a]Orhy, [a]Ephed, Hija, Cora | -- | -- | -- | -- | -- | 24 | → | → | → | ↑ | → | 3 | ↓ | -- | → |
| 0600 | Cathedral | RO-1 | 68-74[f] | [a]Orhy, [a]Hija, [a]Atca2, Epned | 62 | -- | -- | 64 | -- | -- | → | → | ↓ | → | → | 3 | ↓ | S→ | → |
| | | MO-1 | 68-80 | [a]Orhy, [a]Atca2 | -- | -- | -- | -- | -- | -- | ↓ | ↑ | ↑ | -- | ↓ | 4 | ↘ | S→ | → |
| | | MO-2 | 68-80 | [a]Hija, [a]Orhy, [a]Atca2 | -- | -- | -- | -- | -- | -- | → | ↑ | → | → | → | 3 | ↑ | S↑ | → |
| | | MO-3 | 68-80 | [a]Hija, [a]Orhy, [a]Atca2 | -- | -- | -- | -- | -- | -- | ↓ | → | ↓ | → | ↓ | 4 | ↓ | -- | ↓ |
| | | MO-4 | 68-80 | [a]Orhy, Spcr, Bogr | -- | -- | -- | -- | -- | -- | -- | ↑ | ↓ | → | ↓ | 4 | ↓ | -- | ↓ |
| | | FB-1 | 68-80 | [a]Hija, [a]Orhy | -- | -- | -- | -- | -- | -- | -- | ↑ | ↓ | ↑ | → | 3 | → | U↓ | → |
| | | FB-2 | 68-80 | [a]Hija, [a]Orhy, [a]Atco | -- | -- | -- | -- | -- | -- | ↓ | ↑ | → | ↑ | ↑ | 3 | ↑ | U↓ | ↑ |
| | | FB-3 | 73-80 | [a]Atco4 | -- | -- | -- | -- | -- | -- | ↑ | ↓ | -- | -- | → | 3 | → | -- | → |
| 0103 | Cedar Point | C-1 | 73-80 | [a]Orhy, [a]Epne | Average for 1969 90% | | | | | | → | → | ↑ | -- | ↑ | 3 | ↑ | U↓ | ↑ |
| | | C-2 | 73-80 | [a]Orhy, [a]Epne | Average for 1969 70% | | | | | | ↓ | → | ↓ | -- | ↑ | 3 | ↓ | S↑ | → |
| | | C-3 | 73-80 | [a]Orhy, [a]Epne | | | | | | | ↑ | → | ↑ | -- | → | 3 | ↑ | S→ | ↑ |
| | | C-4 | 73-80 | [a]Eula5, [a]Hija | Average for 1969 31% | | | | | | ↓ | → | -- | ↑ | → | 3 | ↑ | U↓ | → |
| 0104 | Crescent Creek | Eagle EB-1 | 67-80 | [a]Agcr, Sihy, Orhy, Ephed, Bogr, Amut, Cemo | 76 | 60 | -- | 71-76 | 75 | 48 | -- | → | ↑ | -- | ↑ | 2 | ↑ | S↑ | ↑ |
| | | EB-2 | 67-80 | [a]Agcr, Sihy, Ephed, Bogr | 75 | -- | -- | 77-73 | 31-18 | 61 | -- | → | → | -- | ↑ | 3 | ↑ | U↓ | ↑ |
| | | Mountain M-1 | 68-80 | [a]Bogr, [a]Sihy, [a]Ararn, Poa, Agsp, Stipa | 19 | 75 | 36 | 15-75 | -- | -- | ↓ | → | ↓ | ↓ | ↓ | 4 | → | U↓ | ↓ |
| | | M-2 | 68-80 | [a]Poa, [a]Artem, Stipa, Sihy, Agsp. | -- | -- | -- | 75 | 46 | 60 | ↓ | → | → | -- | → | 4 | → | U↓ | → |
| 0107 | Hanksville | H-1 | 74-80 | [a]Orhy, [a]Hija, [a]Atca2, Epne | -- | -- | -- | 48 | -- | -- | -- | → | ↑ | ↑ | ↑ | 3 | ↑ | U↑ | ↑ |
| | | H-2 | 74-80 | [a]Orhy, [a]Hija, Arfi2 | -- | -- | -- | 10 | -- | -- | ↑ | → | ↑ | ↑ | → | 3 | ↑ | S↑ | ↑ |
| | | H-3 | 74-80 | [a]Hija, Gusa2 | -- | -- | -- | 18 | -- | -- | ↑ | → | -- | ↓ | ↓ | 4 | ↓ | U↑ | ↓ |
| | | H-4 | 74-80 | [a]Hija, [a]Atco, Orhy | -- | -- | -- | 51-76 | -- | -- | ↑ | → | -- | → | → | 3 | ↑ | U↑ | → |
| | | H-5 | 74-80 | [a]Hija, Bogr, Cora | -- | -- | -- | -- | -- | -- | ↑ | → | -- | ↓ | → | 3 | ↓ | S↑ | → |
| | | H-6 | 74-80 | [a]Hija, [a]Orhy, [a]Ephed, [a]Spcr | -- | -- | -- | -- | -- | -- | ↑ | → | ↑ | → | ↑ | 3 | ↑ | U↑ | ↑ |

APPENDIX 2, TABLE 1 (continued)

| Code No. | Allotment | Pasture and Plot No. | Years of Records | Index[a] or Key Species | Percent Utilization: Browse[b] 1 | Browse 2 | Browse 3 | Grass[b] 1 | Grass 2 | Grass 3 | Trend of Key[c]: Browse | Seedling | Grass: Cool | Grass: Warm | Apparent Condition and Trend[c]: Photo Trend | Condition[d] | Index | 1977[e] | Longtime Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0603 | Hartnet | BF-1 | 67-80 | [a]Orhy, [a]Hija, [a]Atrip | 26 | -- | -- | 4 | -- | -- | ↓ | ↑ | ↑ | ↓ | → | 3 | ↓ | U→ | → |
| | | BF-2 | 67-80 | [a]Hija, [a]Orhy, [a]Atca, Spcr | 70 | 54 | 51 | 63 | 62 | 38 | ↓ | → | ↑ | ↓ | → | 3 | ↓ | S→ | → |
| | | BF-3 | 67-80 | [a]Hija, [a]Atco, [a]Orhy, Arfi2, Spcr | -- | -- | -- | 56 | 68 | -- 10 23 | ↓ | ↑ | ↑ | ↓ | → | 3 | → | S→ | → |
| | | BF-4 | -- | | | | | | | | | | | | -- | -- | -- | S→ | -- |
| | Upper Hartnet | UH-1 | 67-80 | [a]Orhy, [a]Hija, [a]Atco, Spai | 10 | 58 | -- | 30 | 70 | -- | → | ↑ | → | ↓ | → | 3 | → | -- | → |
| | | UH-2 | 67-80 | [a]Orhy, [a]Hija, [a]Atco, Spai | 10 | 58 | -- | 52 | 70 | -- | ↓ | ↑ | ↓ | ↓ | → | 3 | ↓ | -- | ↓ |
| | | UH-3 | 67-80 | [a]Orhy, [a]Atco, [a]Ararn, Hija, Spai | -- | 58 | -- | 50 | 70 | -- | → | ↑ | ↓ | -- | → | 3 | ↓ | -- | → |
| | South Oesert | SO-1 | 67-80 | [a]Orhy, [a]Sporo, Epne, Atca2, Hija | 82 | -- | -- | 74-78 62-73 | -- | -- | -- | → | ↑ | → | ↓ | 4 | ↑ | -- | → |
| | | SO-2 | 67-80 | [a]Orhy, [a]Hija, [a]Atca2, Spai | 70-36 | -- | 76 | 46-58 74-66 | -- | 22-28 | → | ↑ | ↑ | ↓ | → | 3 | → | -- | → |
| | | SO-3 | 67-80 | [a]Orhy, [a]Hija, [a]Atca2, Spai, Eula5 | 70 | 68 | 26-82 | 60 | 69 | 16-26 | ↓ | ↑ | ↑ | ↓ | → | 4 | ↓ | -- | → |
| 0108 | Nasty Flat | South Cr SC-1 | 69-80 | [a]Agcr, [a]Mesa | 75 (Mesa) | 76 | 88 | 72 | 75 | 57 | -- | → | ↑ | ↓ (Mesa) | ↓ | 4 | ↑ | S↑ | → |
| | | Homestead H-1 | 68-80 | [a]Poa, [a]Stle, Agin, Sihy | -- | -- | -- | 64 | -- | 60 | -- | → | ↑ | -- | → | 3 | ↑ | U↓ | → |
| | | H-2 | 68-80 | [a]Poa, [a]Stle, Artr2, Sihy | -- | -- | -- | 36-39 | -- | -- | ↑ | → | ↓ | -- | → | 4 | ↓ | U↑ | ↓ |
| | | H-3 | 68-80 | [a]Poa, [a]Stle, Ararn, Sihy, Chvis, Carex | -- | -- | -- | 44-48 | -- | 55-39 | ↓ | → | ↑ | -- | ↓ | 4 | ↓ | U↓ | ↓ |
| | | H-4 | 71-80 | [a]Poa, [a]Ararn, [a]Heki, [a]Sihy, [a]Stle, [a]Feov | -- | -- | -- | -- | -- | 22-38 | ↓ | → | ↓ | -- | → | 4 | ↓ | U↓ | ↓ |
| | | Ougout O-1 | 69-80 | [a]Agcr, Mesa | -- | -- | 88 | 70 | 50 | 47 | ↑ (Mesa) | → | ↑ | -- | ↑ | 2 | ↑ | S↑ | ↑ |
| 0610 | North Bench | NB-1 | 68-80 | [a]Orhy, [a]Epto, Hija, Arfi2, Spcr, Atca2 | 16-40 76 | -- | -- | 38-50 45-52 | -- | -- | ↑ | ↑ | ↑ | -- | ↑ | 3 | ↑ | S↑ | ↑ |
| | | NB-2 | 68-80 | [a]Orhy, [a]Epto, Orhy, Hija, Spcr, Arfi2 | 47-53 | -- | -- | 30-40 33-46 | -- | -- | ↑ | ↑ | ↑ | -- | → | 3 | ↑ | U↑ | → |
| | | NB-3 | 68-80 | [a]Orhy, [a]Epto, Hija, Spcr, Arfi2 | 25 | -- | -- | 46-49 36-43 | -- | -- | → | ↑ | ↑ | ↑ | ↑ | 3 | ↑ | U↓ | ↑ |
| 0109 | Pennell | Horn H-1 | 69-80 | [a]Agcr, [a]Mesa, Cemo2, Putr2 | -- | -- | 10-75 70 | -- (Mesa | -- 60)→ | 12-64 | -- | → | ↑ | -- | → | 2 | ↑ | U↑ | ↑ |
| | | H-2 | 69-80 | [a]Agcr, [a]Mesa, Orhy, Sihy | -- | -- | -- | 73 | 48 | 14-47 59 | -- | → | ↑ | -- | ↑ | 2 | ↑ | S↑ | ↑ |
| | | H-4 | 69-80 | [a]Agcr, Mesa, Cerco, Amut | -- | -- | 50-60 | -- | -- | 66-67 | -- | ↓ | → | -- | ↑ | 2 | → | S↑ | → |
| | | H-5 | 69-80 | [a]Agcr, Mesa, Agin2, Orhy | -- | -- | -- | 79-74 | 35 31 | 42 58 | -- | ↓ | → | -- | → | 3 | → | U↓ | → |
| | | H-6 | 68-80 | [a]Agcr, Mesa, Sihy, Artr2 | -- | -- | 27-50 | 68-83 | -- | 14-26 | -- | ↑ | → | -- | → | 2 | → | S↑ | → |
| | | H-7 | 68-80 | [a]Agcr, [a]Artr, [a]Arfr, [a]Ararn, Poa, Stle, Cemo2, Comes | -- | -- | 30-71 | -- | -- | 30-46 | ↑ | → | ↑ | -- | → | 3 | ↑ | S↑ | ↑ |
| | Wolverton | W-6 | 68-80 | [a]Agcr, Mesa, Putr2, Atca2, Comes | -- | -- | 50-71 | -- Mesa | 18 | 32-40 78→84-74 | ↑ | → | ↑ | -- | → | 3 | ↑ | S↑ | → |
| | | W-7 | 68-80 | [a]Agcr, Mesa, Orhy, Sihy | -- | -- | -- | 41-86 | -- | 60 | ↑ | → | ↑ | -- | → | 4 | ↑ | S↑ | ↑ |
| | | W-8 | 68-80 | [a]Sihy, [a]Ararn, Agsm, [a]Agsp, Poa, Amut, Orhy, Stipa, Cemo2 | 19-38 | -- | 30-60 | -- | 16-34 | 30-53 | ↑ | → | ↓ | -- | → | 4 | → | U↓ | → |
| | | W-9 | 68-80 | [a]Sihy, [a]Artr2, [a]Ararn, Poa++, Stipa | 16 | -- | -- | 44-64 | -- | 10-46 | ↑ | → | → | -- | → | 3 | → | S↑ | → |
| | Bulldog | 8-6 | 70-80 | [a]Orhy, [a]Spcr, [a]Ararn, [a]Artr2, [a]Bogr2, Sihy, Poa++ | -- | -- | -- | -- | -- | 36-54 | ↑ | → | ↓ | -- | → | 4 | ↑ | S↑ | → |
| | | 8-7 | 68-80 | [a]Sihy, [a]Bogr2, [a]Artr2, Luca, [a]Orhy, [a]Stco, Poa | -- | -- | -- | 51-49 | -- | 28-70 21-43 | ↑ | → | ↓ | -- | → | 4 | → | S↑ | → |
| | | 8-8 | 69-80 | [a]Stle, [a]Artr2, Pose, Sihy, Stipa, Agsm, Stle Cemo2, Amut | -- | -- | -- | 50-51 | -- | 54-63 | → | → | ↑ | -- | → | 3 | ↑ | U↓ | ↑ |

APPENDIX 2, TABLE 1 (continued)

| Code No. | Allotment | Pasture and Plot No. | Years of Records | Index[a] or Key Species | Percent Utilization: Browse[b] 1 | Browse 2 | Browse 3 | Grass[b] 1 | Grass 2 | Grass 3 | Trend of Key[c]: Browse | Seedling | Grass: Cool | Grass: Warm | Apparent Condition and Trend[c]: Photo Trend | Condition[d] | Index 1977[e] | | Longtime Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0901 | Robbers Roost | RR-1a | 69-79 | [a]Orhy, [a]Hija, [a]Epvi, Bogr, Spcr, Gusa2 | -- | -- | -- | L-M | -- | M-H | ↑ | ↑ | → | ↑ | → | 3 | ↑ | S→ | ↑ |
| | | RR-1b | 69-79 | [a]Orhy, [a]Hija, [a]Epvi, [a]Bogr, Spcr, Gusa2 | -- | -- | -- | L-M | -- | M-H | ↑ | ↑ | → | ↑ | → | 3 | ↑ | S→ | ↑ |
| | | RR-2a | 69-79 | [a]Orhy, [a]Hija, Cora | -- | -- | -- | L | -- | -- | ↓ | ↑ | ↓ | → | → | 3 | ↑ | S→ | ↑ |
| | | RR-2b | 69-79 | [a]Orhy, [a]Hija, Cora | -- | -- | -- | L | -- | -- | Not key -- | -- | ↑ | ↑ | → | 3 | ↑ | S→ | ↑ |
| | | RR-3a | 69-79 | [a]Orhy, [a]Hija, Spcr, Gusa2 | -- | -- | -- | H | -- | 21 | ↑ | ↓ | ↓ | ↑ | ↓ | 4 | ↑ | S→ | → |
| | | RR-3b | 69-79 | [a]Orhy, [a]Hija, Spcr, Gusa2 | -- | -- | -- | H | -- | 21 | Gusa ↑ | ↑ | ↓ | ↑ | → | 3 | ↑ | S→ | → |
| | | RR-4a | 69-79 | [a]Epvi, Bogr | -- | -- | -- | -- | -- | -- | Gusa -- | ↓ | -- | ↑ | ↓ | 4 | ↑ | S→ | → |
| | | RR-4b | 69-79 | [a]Epvi, Bogr | -- | -- | -- | -- | -- | -- | -- | 0 | -- | ↑ | → | 3 | ↑ | S→ | → |
| 0110 | Rockies | Starr S-1 | 68-80 | [a]Hija, [a]Orhy, Spcr, [a]Atca2, | -- | -- | -- | 84-65 | -- | -- | ↑ | → | ↓ | -- | ↑ | 2 | ↑ | U→ | ↑ |
| | | S-2 | 68-80 | [a]Hija, Artr2, Brte, Spcr | -- | -- | -- | 50 43 | -- | -- | ↑ | → | ↓ | -- | → | 3 | ↓ | S↑ | → |
| | | S-6 | 68-80 | [a]Orhy, [a]Hija, Cora | -- | -- | -- | 66-68 | -- | -- | → | ↑ | ↓ | ↑ | → | 3 | → | U↓ | → |
| | | S-7 | 68-80 | [a]Orhy, [a]Hija, [a]Atca2, Cora, Spcr, Gusa2, Brte, Atca2 | 60-85 | -- | -- | 50-41 74-87 | -- | -- | ↓ | ↑ | ↑ | ↑ | → | 3 | ↓ | S↓ | → |
| | | S-8 | 68-80 | [a]Hija, Brte, Gusa2, Artr2 | -- | -- | -- | 25-64 | -- | -- | ↑ | → | -- | ↓ | ↓ | 3 | ↓ | S↓ | ↓ |
| | Sand | Sd-1 | 68-80 | [a]Orhy, [a]Epheo, Sporo, Hija | -- | -- | -- | 90-63 | -- | -- | ↑ | → | ↓ | -- | → | 3 | ↑ | U↑ | → |
| | | Sd-2 | 68-80 | [a]Orhy, [a]Hija, Cora, Gusa2, Spcr | -- | -- | -- | 49-54 | -- | -- | ↑ | → | ↓ | ↑ | → | 3 | ↑ | U↓ | ↑ |
| | | Sd-8 | 68-80 | [a]Hija, [a]Atco, Brte, Astra, Cora | 41 | -- | -- | 63-67 31 | -- | -- | ↑ | → | -- | ↓ | → | 3 | → | U↓ | → |
| | | Sd-9 | 68-80 | [a]Hija, [a]Orhy, Cora | -- | -- | -- | 40-71 | -- | -- | ↑ | → | ↓ | → | → | 3 | ↓ | U↓ | ↓ |
| 0111 | Sandy 1 | S-1 | 67-80 | [a]Hija, [a]Orhy, [a]Epto, Atca2 | 58 | -- | 58 | 33 | -- | 51 | → | ↑ | → | ↑ | ↑ | 3 | ↑ | U↑ | ↑ |
| | | S-2 | 67-80 | Arlo, Gusa2 [a]Hija, [a]Orhy, [a]Atca2, Spcr | 70 | -- | -- | 10-85 | -- | -- | ↓ | ↑ | ↑ | ↓ | ↑ | 3 | → | U↓ | → |
| | | S-3 | 67-80 | [a]Hija, [a]Orhy, [a]Atrip, Spcr, Gusa2 | 71 | -- | -- | 60-90 | -- 71 | -- | ↓ | ↑ | ↓ | → | → | 3 | → | U↓ | → |
| | | S-4 | 67-80 | [a]Hija, [a]Orhy, [a]Spcr, [a]Atrip | -- | -- | -- | 0-84 50 | -- | -- | ↓ | ↑ | → | → | → | 3 | ↓ | U↓ | → |
| 0112 | Sandy 2 | Option O-1 | 67-80 | [a]Orhy, [a]Spcr, [a]Hija, [a]Atrip, Atca2, Ephed | 45 | -- | 62-66 | 53 Ave. | -- | 33 66 | ↓ | ↑ | ↑ | ↑ | ↑ | 2 | → | U↑ | → |
| | | O-2 | 67-80 | [a]Hija, [a]Orhy, [a]Atnu2, Atca2, Spcr | 56 | -- | 63 | 65 | -- | 10 | ↑ | ↑ | ↓ | ↑ | ↑ | 3 | ↑ | U↑ | ↑ |
| | | O-3 | 67-80 | [a]Hija, [a]Atco, Orhy, Spcr, Atca2, Ephed | 70 | 70 | 57 | 64 | -- | 67 | ↑ | → | -- | ↑ | → | 3 | ↑ | S↑ | ↑ |
| | | O-4 | 67-80 | [a]Orhy, [a]Atco, Gusa2 | -- | -- | -- | 62 | -- | -- | → | ↑ | ↑ | -- | → | 3 | ↑ | -- | ↑ |
| | | O-5 | 67-80 | [a]Hija, [a]Orhy, [a]Atco, Atnu2, Spcr, Atca2 | 65-72 | -- | -- | 69 | -- | -- | ↓ | ↑ | ↑ | ↑ | → | 2 | → | -- | → |
| | | T-3 | 67-80 | [a]Agcr, [a]Ephed, Artr, Atca2, Orhy, Spcr, Hija, | 70 | -- | -- | 66-84 | -- | -- | ↑ | → | ↓ | ↓ | ↓ | 4 | ↓ | S↓ | ↓ |
| | | T-4 | 67-80 | [a]Stco, [a]Orhy, [a]Ephed | -- | -- | -- | 62-67 | -- | -- | ↑ | ↑ | → | -- | → | 2 | ↑ | S↓ | ↑ |
| | | SW-6 | 67-80 | [a]Orhy, [a]Hija, [a]Atca2, Spcr | -- | -- | -- | 74-84 | -- | -- | ↓ | ↑ | → | ↑ | ↓ | 3 | ↑ | U↓ | → |
| 0113 | Sandy 3 | S-1 | 67-80 | [a]Hija, [a]Orhy, [a]Atca2, Gusa2, Spcr | -- | -- | -- | 75-59 54 | -- | -- | ↑ | → | → | ↓ | → | 3 | ↑ | U↓ | ↑ |
| | | S-2 | 67-80 | [a]Spcr, [a]Orhy, [a]Atca2, Hija, Gusa2 | -- | -- | -- 54 | 76-59 | -- | -- | ↑ | → | → | ↓ | ↑ | 3 | ↑ | U↓ | ↑ |
| | | S-3 | 67-80 | [a]Orhy, [a]Hija, [a]Atca2, Spcr | -- | -- | -- | 59-54 | -- | -- | ↓ | → | ↓ | ↓ | → | 3 | ↓ | S↑ | ↓ |
| | | S-4 | 67-80 | [a]Orhy, [a]Hija, [a]Atca2, Spcr | -- | -- | -- | 59-54 | -- | -- | ↓ | → | ↑ | → | → | 3 | ↓ | S↑ | → |
| 0114 | Sawmill Basin | Ellen E-1 | 68-80 | [a]Agcr, [a]Brin, [a]Dagl, [a]Agda, Sihy, Brte | -- | -- | -- | 10 | 70 | 10 | -- | ↑ | ↓ | -- | ↑ | 2 | ↓ | S↑ | → |
| | | Creek E-2 | 68-80 | [a]Agcr, [a]Pose, [a]Stle, Brte, Artr2 | -- | -- | -- | 60 | 70 | 20 | → | ↑ | ↑ | -- | ↓ | 3 | ↑ | S↓ | → |
| | | Bull 8-3 | 68-80 | [a]Agcr, Sihy, Pofe, Artr2 | -- | -- | -- | 70 | 80 | 10 | ↓ | ↓ | ↓ | -- | ↓ | 3 | ↓ | U↓ | ↓ |

APPENOIX 2 TABLE 1 (concluded)

| Code No. | Allotment | Pasture and Plot No. | Years of Records | Index[a] or Key Species | Percent Utilization: Browse[b] 1 | Browse 2 | Browse 3 | Grass[b] 1 | Grass 2 | Grass 3 | Trend of Key[c]: Browse | Seedling | Grass: Cool | Grass: Warm | Apparent Condition and Trend[c]: Photo Trend | Condition[d] | Index | 1977[e] | Longtime Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0115 | Steele Butte | Stevens S-1 | 67-80 | [a]Orhy, [a]Atco | -- | -- | -- | 70-83 | -- | -- | ↑ | ↑ | ↑ | -- | → | 3 | ↑ | U↓ | → |
| | | S-2 | 67-80 | [a]Hija, [a]Atco | -- | -- | -- | 70 | -- | -- | ↑ | → | -- | ↓ | ↓ | 3 | ↑ | U↑ | ↓ |
| | | S-3 | 67-80 | [a]Orhy, [a]Atco | -- | -- | -- | 21 | -- | -- | ↑ | → | → | -- | → | 3 | ↑ | S↑ | ↑ |
| | | S-4 | 67-80 | [a]Hija, [a]Atca2 | -- | -- | -- | 57-79 64 | -- | -- | ↑ | → | -- | ↓ | ↓ | 3 | ↓ | S↑ | ↓ |
| | | S-5 | 67-80 | [a]Orhy, [a]Atca2 | -- | -- | -- | 42-67 | -- | -- | ↓ | ↑ | ↑ | -- | → | 3 | ↑ | S↑ | → |
| | | S-6 | 67-80 | [a]Hija, Atca2, Qrhy, Spca | 47-63 | -- | -- | 67 56 | -- | -- | ↑ | → | -- | → | ↑ | 3 | ↑ | S↑ | ↑ |
| | | S-7 | 67-80 | [a]Orhy, [a]Hija, [a]Atco, Atca2, Spcr | 26-63 | -- | 10 | 67 56 | -- | 10 15 | ↑ | ↑ | ↓ | → | → | 2 | → | S↑ | → |
| | | LT-1 | 67-80 | [a]Orhy, [a]Atca2, Hija | -- | -- | -- | 41-63 | -- | -- | → | ↑ | → | -- | → | 3 | → | S↓ | → |
| | Spring | T-1 | 67-80 | [a]Agcr, Qrhy, [a]Ephed | -- | -- | -- | 37-88 | -- | 20 | ↑ | ↑ | ↑ | -- | → | 2 | ↑ | S↑ | ↑ |
| | | T-2 | 67-80 | [a]Agcr, [a]Orhy, [a]Ephed | -- | -- | -- | 37-88 | -- | -- | ↓ | → | ↓ | -- | ↓ | 3 | ↓ | S↓ | ↓ |
| | | C-3 | 67-80 | [a]Hija, [a]Atca2 | -- | 70 | -- | -- | 70 | -- | ↓ | ↑ | -- | ↑ | → | 3 | ↑ | U↓ | → |
| | | C-4 | 73-75 | [a]Hija, [a]Orhy, [a]Agcr (Location of plot is lost, photo plot only). | -- | -- | 37 | -- | -- | -- | -- | ↓ | → | ↑ | → | 4 | ↑ | U↓ | → |
| 0117 | Waterpocket | Thompson T-1 | 68-79 | [a]Hija, [a]Feov, [a]Spcr, [a]Atca2, Gusa2 | -- | -- | -- | 47 | -- | -- | ↓ | ↑ | ↑ | → | ↓ | 4 | ↓ | S↑ | ↓ |
| | | T-2 | 68-79 | [a]Feov, [a]Spcr, [a]Stco, Arlo, [a]Epne, Qrhy, Atco, Hija | 80 | -- | -- | 60 | -- | -- | ↓ | → | ↑ | ↓ | ↓ | 4 | ↓ | U↓ | ↓ |
| | | T-3 | 68-79 | [a]Feov, [a]Spcr, [a]Hija, [a]Orhy, Epvi, Atco, Gusa2, Cora, Atca2 | 80 | -- | -- | 35-64 | 48-68 | -- | ↑ | ↑ | ↓ | ↓ | ↓ | 3 | ↓ | S↓ | ↓ |
| | | Hall H-4 | 68-79 | [a]Feov, [a]Spcr, [a]Orhy, [a]Hija, Arfi2, Atco, Epne | 40-70 | -- | -- | 46-90 | -- | -- | → | ↓ | ↓ | ↓ | ↓ | 2 | ↓ | U↓ | ↓ |

[a]Included in Index. Other species used as key or indicator species.

[b]1. Prior to 1975
2. 1975-79
3. 1979-81.

[c]↑ = up
→ = not apparent
↓ = down.

[d]Relative value, range condition based on photo appearance:
1 = Excellent; 2 = Good; 3 = Fair; 4 = Poor.

[e]From 1977 URA Condition and Trend S = Satisfactory, U = Unsatisfactory.

[f]Plot Oestroyed.

United States Department of the Interior

IN REPLY REFER TO
1608 HMRA-H
(U-050)

BUREAU OF LAND MANAGEMENT
RICHFIELD DISTRICT OFFICE
150 East 900 North
Richfield, Utah 84701

STAFF REPORT

Title: Grazing MFP/EIS, Henry Mountain Planning Area, Solutions to Problems Encountered in Processing Data from the Soil-Vegetation Inventory of 1980

Date: August 6, 1982

Authors: Max Robinson, Jim Buchanan, Jan Knight, Richard Felthousen, and Roger Twitchell

A decision was made by the Richfield District Manager, Donald Pendleton, to use data from the soil-vegetation inventory of the Henry Mountain Planning Area in preparing the planning documents and grazing management EIS. This decision was based on Washington Office Instruction Memorandum No. 82-292, "Final Grazing Management Policy." Time schedules for completing these documents were established on the assumption that all data from the inventory could be processed promptly and accurately by computer programs that were developed, although not fully tested. It was also assumed that other BLM Districts which had previously used the inventory would have already identified problems to the Denver Service Center (DSC) and had corrections implemented. In both cases, however, the assumptions were incorrect and programming problems persisted. As a result, a material deviation request was submitted on June 23, 1982 ("Request for Material Deviation in Final Filing Date for the Henry Mountain Grazing Environmental Impact Statement," 1972 HM 032). The following is a discussion of the events and problems which precipitated the material deviation request and the solutions developed by the Core Team composed of Max Robinson, Jim Buchanan, Jan Knight, Dick Felthousen, and Roger Twitchell:

Because of the complex issues identified with livestock grazing and use of the range by big game animals, a soil-vegetation inventory was made of the grazing lands within the 1,893,272 acres of the Henry Mountain Planning Area. The field work was properly executed and the maps and field data were accurately prepared. It became apparent, however, as the data was processed that major problems existed in the handling of the data within the computer program. It has taken considerable effort on the part of the Richfield District personnel as well as the Utah State Office and DSC to correct the program and complete the analysis of the data. Many hours of overtime, including nights and weekends, have gone into the calculations in order to make a meaningful analysis of the data.

A major effort was made to complete the planning documents and grazing environmental impact statement (EIS) according to schedule. The final tabulations assigning forage use to the various kinds of animals (livestock, bison, deer, antelope, bighorn and wild burros) under the five management alternatives showed values inconsistent with other records and on-the-ground studies. In

general, there appeared to be forage production in excess of what livestock use records and ongoing trend and utilization studies indicated was available on the ground. This occurred despite the fact that care was exercised in assigning conservative proper use factors to low-value, super-abundant forage species. Time was needed to more clearly identify the problems and to make corrections in the data and in data processing.

This staff report documents the reasons for the request, identifies the problems encountered in processing the soil-vegetation inventory data, and outlines the procedures being followed and progress being made in processing this data.

The five main problem areas encountered were:

A. Accounting for suitability of areas for grazing
B. Height code corrections
C. Application of proper use factors (PUFs) without fully accounting for animal diets
D. A computer program that appeared to be erratic in assignments of forage among competing animals
E. Computer downtime and slowdowns in data processing.

A. Initial design specifications for the soil-vegetation inventory automatic data processing (ADP) system computed grazing capacity by a weighted average of all strata in a site-writeup area (SWA), including barren and non-range strata. This allowed for gross suitability determinations only, introducing errors into the distribution of forage for grazing animals. The overall effect was to lower total grazing capacity by increasing the area that would be determined as unsuitable for livestock and bison. Areas that were known to be suitable would, through the weighting process, be designated as unsuitable. To correct this problem, lengthy hand calculations of stratum grazing capacities for all animals in all allotments, and a great deal of time editing the subsequent suitability changes into the allocation program were required of District personnel to circumvent the existing processing method. These calculations are included in the soil-vegetation inventory allotment files.

B. The inventory classified vegetation into four layers which were identified by height codes:

| Code No. | Feet |
|---|---|
| 1 | 0 - 3 |
| 2 | 3 - 4½ |
| 3 | 4½ - 7 |
| 4 | 7 and above |

The availability of forage for each kind of animal was to be based on assigned height codes. The original computer program did not have the capacity to handle the several combinations involved. When initially applied, height codes considered for forage species were selected erratically. The DSC ADP staff attempted to correct this problem by programming the total plant community (all four height codes) to be analyzed as forage. This neglected acknowledged grazing heights of foraging animals. As a result, excess amounts of trees and shrubs were considered forage and calculated into grazing capacity. The District staff edited the program to compute forage to 4½' for all grazing animals.

C. Adjustments had to be made for errors that resulted from assigning normal proper use factors (PUFs) to super-abundant, relatively low-value forage species. PUFs assigned to such species as sagebrush, oakbrush, pinyon and juniper were too high, and when applied over a wide area resulted in grazing capacity estimates in excess of what was reasonable. This was particularly true for big game species. Even though corrections were made in the PUFs, it was not until all forage distribution runs were completed that the extent of the errors was fully understood. It was evident that a more complete, accurate, and rapid means for evaluating animal diets and adjusting PUFs was needed. With the help of Lynn Fikstad, Ed Harne, and Diana Wilcox of the Utah State Office, and Scott McPherson and William West of the DSC, computer programs were developed that made it possible to compute animal diets and plant composition on an allotment basis. Until July 7, 1982 all diet calculations for the various kinds and combinations of animals were done by tedious hand calculations, because adjustment of PUFs was needed to correct these diets.

Following a review of the literature and after consulting with various experts in the field, target diets and acceptable ranges of grass, forbs and shrub species were established for all animals (see Attachment 1 for big game animals and Attachment 2 for livestock). Acceptable levels of super-abundant, relatively low-value forage species in the diets were also established. The basis for establishing these targets and ranges for various forage species was the nutrient requirements of the various kinds of animals as determined from research. Protein needs at various stages of animal development and at different seasons of the year were used as criteria. For example, does nursing fawns require a higher level of protein and a more succulent forb diet than a wintering herd of mature deer or cattle. (Attachment 3 is a list of references used.) Diets for all animals on all allotments were then evaluated in relation to these target diets and modified when necessary. District personnel felt that the impact of grazing on the basic soil and vegetation resource that could result from assigning improper amounts of forage to animal use, either livestock or big game, was of even greater concern.

D. What appeared to be erratic behavior of the computer program in assigning forage to the various kinds of animal uses was resolved by making a more complete and better definition of the relationship showing tradeoffs between competing animals. An example showing tradeoffs between cattle and sheep is attached in the form of a curve (Attachment 4). Like relationships include game animals. A relationship involving several competing animals cannot be plotted as a simple curve; however, it can be shown in tabular form.

To refine relationships, PUFs and AUFs on an allotment basis, rather than key area bases, were adjusted (based on diets as previously described); allowable use factors (AUFs) were lowered on major forage species; and a larger number of intermediate points were identified and, for illustration and a better understanding of the relationship, plotted. This shows various possible stocking combinations for the several competing animals.

E. Computer downtime and slowdowns in data processing have been major factors in the length of time needed to complete the recommendations for range forage use. Daytime use of the computer was extremely slow and interference on the lines caused lost data and frustration with the program. It was necessary for Richfield District personnel involved in the data processing effort to work the computer before 8:00 a.m. and after 5:00 p.m. on weekdays and on

weekends. Use of the time-sharing system during these off hours significantly reduced the processing time. Processing time was greatly reduced, however, after the Utah State Computer Specialist Lynn Fikstad designed a text editor program enabling us to process batch loads without having to sit at the terminal and run each batch through the allocation model. This program has been in use since early July.

On this date, August 12, 1982, the progress has been made on the following five problem areas identified:

1. Corrections have been made for suitability of the range for use by livestock and bison. Limitations of the range as habitat for other big game animals has been recognized, although not fully accounted for.

2. Height code limitations of forage use has been accounted for.

3. PUFs have been adjusted for livestock and big game animals on the basis of diets within each grazing allotment.

4. The computer is now being used effectively to assign forage among competing animals.

5. Advantage is being taken of text edited batch runs and other programs to hasten the data handling process.

Enclosures: 4

Attachment 1

Big Game Target Diets and Acceptable Ranges
for Soil-Vegetation Inventory Allocation Process

| Deer: Species | Season | |
|---|---|---|
| | Summer | Winter |
| Browse | 65 (60-70) | 85 (80-90) |
| Forbs | 25 (20-30) | 10 (5-15) |
| Grass | 10 (5-15) | 5 (0-10) |

| Bison: Species | Summer | Winter | Yearlong |
|---|---|---|---|
| Browse | 0 (0-5) | 10 (0-10) | 5 (0-5) |
| Forbs | 5 (0-10) | 15 (10-20) | 15 (10-20) |
| Grass | 95 (85-100) | 75 (70-80) | 80 (75-85) |

| Antelope: Species | Yearlong |
|---|---|
| Browse | 65 (60-70) |
| Forbs | 30 (25-35) |
| Grass | 5 (0-10) |

| Bighorn Sheep: Species | Yearlong |
|---|---|
| Browse | 40 (35-45) |
| Forbs | 20 (15-25) |
| Grass | 40 (35-45) |

Attachment 2

Target Diets and Acceptable Ranges for Livestock

| Sheep | Winter | |
|---|---|---|
| Grass | 35 | (25-40) |
| Forbs | 10 | (2-10+) |
| Shrubs | 55 | (40-60) |

| Sheep | Winter | |
|---|---|---|
| Grass | 35 | (20-40) |
| Forbs | 35 | (10-40+) |
| Shrubs | 30 | (25-40) |

| Cattle | Winter (Fall, Winter Spring) | |
|---|---|---|
| Grass | 75 | 40-80 |
| Forbs | 5 | 2-10+ |
| Shrubs | 20 | 15-40 |

| Cattle | Summer | |
|---|---|---|
| Grass | 85 | 60-90 |
| Forbs | 5 | 2-10+ |
| Shrubs | 10 | 10-30 |

Attachment 3

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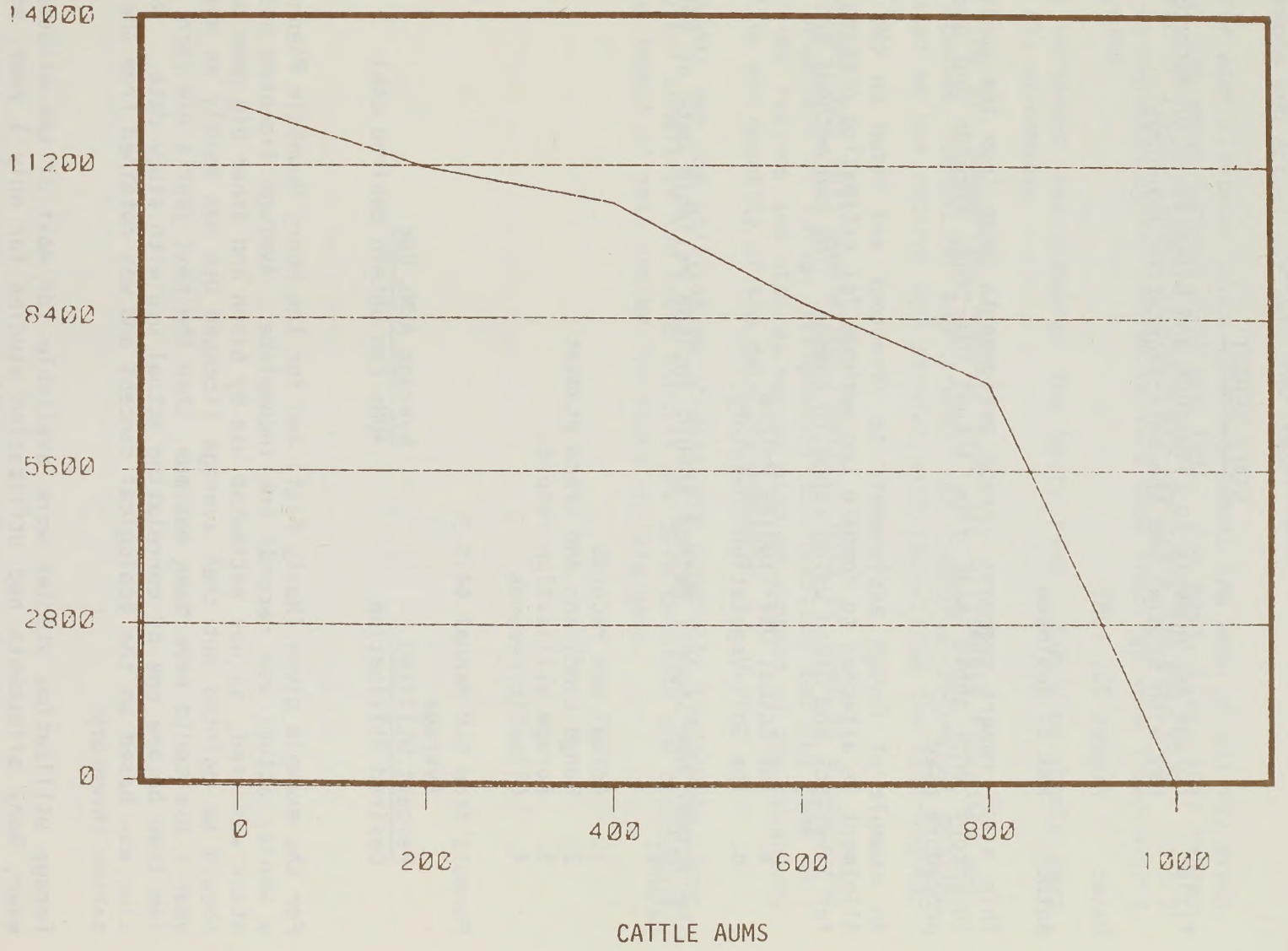
AN EXAMPLE OF HANKSVILLE ALLOTMENT CATTLE/SHEEP TRADEOFF



IN REPLY REFER TO

# United States Department of the Interior

BUREAU OF LAND MANAGEMENT

RICHFIELD DISTRICT OFFICE
150 East 900 North
Richfield, Utah 84701

STAFF REPORT

Title: Forage Assignments to Livestock and Bison Based on Records of Use with Studies and the Soil-Vegetation Inventory

Date: August 23, 1982

Author: Max E. Robinson

This staff report compares forage assignments made from the soil-vegetation inventory with those made from Actual Use-Study records and documents the procedure used.

An example of forage assignments to livestock and bison on the Nasty Flat Allotment is attached to compare two methods for estimating grazing capacities for livestock and bison using range in common. The two methods are:

a. The Actual Use-Studies Method
b. The Soil-Vegetation Inventory.

The Actual Use-Studies Method should include reliable data of the following nature:

1. Actual use records
2. Range condition and trend studies
3. Forage utilization records
4. Climatic records

Formula from BLM Manual 4413.3

$$\frac{\text{Average Percent Utilized}}{\text{Desired Utilization}} = \frac{\text{Average AUMs Use}}{\text{AUMs (to obtain desired use)}}$$

For the example given (Nasty Flat) and for the Henry Mountain Planning Area as a whole, actual use records are incomplete. Average licensed use for livestock was used, as was estimated use by bison and other big game animals. It should be pointed out that average licensed use was merely an average. One year's use could have been maximum, then the next year's use zero. The problem then became one of correlating actual use with study data. Range condition was based on the ecological concept and was obtained from the soil-vegetation inventory.

Forage utilization studies were available for most of the allotments. However, many allotments had utilization studies for only 1 year, while others had no data at all. Where data was collected, often only a portion of the key areas within an allotment had been monitored. The utilization studies that had been completed had not been well coordinated with actual use.

## APPENDIX 2

Years prior to 1976 were summarized separately and were used as a basis for assessing the degree of use prior to 1976. These values may be compared with averaged licensed use on the assumption that active preference represents actual use. No attempt, however, was made to use this basis for estimating proposed forage assignments for livestock since there is no assurance that active preference and actual use were the same.

Average use for each allotment since 1976 represents the mean of all key areas monitored for the years between 1976 and 1981. For Nasty Flat, this represented the mean of 1 year (1980) in which all key areas had been read. This 1 year may not be representative. Prior to 1976 some readings were taken over a period of 6 years.

The attached worksheet was prepared for Nasty Flat. Similiar sheets were prepared for all allotments.

Table 3-3 of the EIS summarizes records from all allotments (licensed use, utilization studies, condition and trend) and compares estimated grazing capacities based on use records and studies with those from the soil-vegetation inventory.

It is recommended that soil-vegetation inventory data be used as a basis for recommending proposals of forage assignments to livestock and big game animals. Animal use records and studies may be used as support of the inventory when the quality and quantity of the data are adequate.

Records of animal use and utilization studies are generally inadequate, however. Ecological condition and trend studies are more complete and dependable when assessing impact of past use by livestock and big game.

Enclosures: 1

## APPENDIX 2

Attachment 1 - Work Sheet

Nasty Flat

Cattle (C) use
Preference: 474 AUMs C, Average licensed use 436 AUMs C, Period of use 6/1 - 9/30

| Bison (B) Use | Current | Proposed Management | % |
|---|---|---|---|
| Summer (S) | 411 | 349 | 60 |
| Yearlong (YL) | 274 | 227 | 40 |
| | 685 | 576 | 100 |

Utilization of key species prior to 1976 - 54%, Since 1976 - 56%.

Based on licensed use of livestock and current bison use the following estimates are made of grazing capacities in AUMs:

$\frac{56^{a}}{48^{b}} = \frac{1121}{x}$ $x = 961$

| | AUMs |
|---|---|
| Cattle licensed use | 436 |
| Bison current use | 685 |
| Total | 1121 |

$\frac{1121 - 961}{1121}$ = 14.3% total reduction

Total Use 1121 x .143 = 160 AUMs reduction in total use.

Management goals for bison in AUMs:

Current 685 - Proposed 576 = 109 AUMs reduction to be made for bison.
Therefore,
Total 160 - 109 = 51 AUMs reduction for cattle.

This represents a $\frac{51}{436}$ = 11.7% approx. reduction for cattle

Proposed forage use for cattle based on:

| | | |
|---|---|---|
| Use records and studies | 436 - 51 = 385 | AUMs |
| Based on the soils-vegetation inventory | 399 | AUMs |

This range was classified as being in the following ecological condition:

| Late | Mid | Early |
|---|---|---|
| 16% | 77% | 7% |

Of the eight study plots located in key areas, 7 percent are improving, 33 percent are stable, and 50 percent are declining.

Records of past use and other studies show there are serious problems in distribution of use.

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[a]Average Utilization (%), key species past 5 years.

[b]Proper utilization is based on a weighted average utilization of 48 percent of key species at the end of the grazing period 6/1 - 9/30 (Spring 0.67 mo., Summer 3 mo., Fall 0.33 mo. = 4 mo).

Records from the late 1950s and early 1960s indicate that range conditions during that period have been were very poor and heavily used by cattle and sheep. Bison and deer use was reported to be heavy also. It is difficult to quantify these records.

It is recommended that proposed forage use by cattle follow the soil-vegetation inventory with 399 AUMs (400 AUMs).

This should be followed by close monitoring of cattle numbers and use, and use by big game animals, particularly bison. The proposal should be adjusted based on the results of these studies.

Every attempt should be made to insure proper distribution of use.

# APPENDIX 3

Ranch Budgets
TABLE 1

Small Cattle Ranch Base Situation

| Receipts | Quantity | Unit | Average Weight | Price/Cwt[a] | Total Value |
|---|---|---|---|---|---|
| Yearling Steers | 34 | Head | 575 | $84.65 | $16,569 |
| Yearling Heifers | 22 | Head | 525 | 74.62 | 8,619 |
| Cull Cows | 10 | Head | 950 | 45.38 | 4,311 |
| Cull Bulls | 1 | Head | 1,250 | 59.25 | 741 |
| Horses | -- | | | | |
| 1. Total Receipts | | | | | $30,240 |
| Total Receipts/Head[b] | | | | | 336.00 |

| Cash Costs | Total Costs | Cost/Head[b] |
|---|---|---|
| BLM-Desert Permit | $ 850 | $ 9.44 |
| Forest Permit | 731 | 8.12 |
| Pasture | 2,352 | 26.13 |
| Alfalfa Hay | 4,805 | 53.39 |
| Barley | 510 | 5.67 |
| Bloat Guard | 260 | 2.89 |
| Salt | 169 | 1.88 |
| Custom Hauling | 270 | 3.00 |
| Vet. & Medicine | 357 | 3.97 |
| Mach. Fuel, Lube, & Repair | 3,161 | 35.12 |
| Equipment Lube and Repair | 67 | 0.74 |
| Labor | 3,790 | 42.11 |
| Land Tax | 1,680 | 18.67 |
| Other Tax | 549 | 6.10 |
| Insurance | 88 | 0.98 |
| Interest on Operating Capital | 1,472 | 16.36 |
| 2. Total Cast Costs | $21,111 | 234.57 |
| Other Costs | | |
| 3. Depreciation | $2,647 | 29.41 |
| 4. Interest on Capital Investment | 8,147 | 90.30 |
| 5. Interest on Land Investment | 12,445 | 138.28 |
| 6. Total Other Costs (3+4+5) | 23,219 | 257.99 |
| Total All Costs (2+6) | 44,330 | 492.58 |
| 7. Net Cash Income (1-2) | 9,129 | 101.43 |
| 8. Net Ranch Income (7-3) | 6,482 | 72.02 |
| 9. Return to Land Investment (8-4) | -1,645 | -18.28 |
| Return to Operator (9-5) | -14,090 | -156.56 |

[a]1981 prices - Utah Crop and Livestock Reporting Service.

[b]Determined by dividing by herd size - 90 head.

TABLE 2

Medium Cattle Ranch Base Situation

| Receipts | Quantity | Unit | Average Weight | Price/Cwt[a] | Total Value |
|---|---|---|---|---|---|
| Yearling Steers | 56 | Head | 575 | $84.75 | $27,290 |
| Yearling Heifers | 36 | Head | 525 | 74.62 | 14,103 |
| Cull Cows | 16 | Head | 950 | 45.38 | 6,898 |
| Cull Bulls | 2 | Head | 1,250 | 59.25 | 1,481 |
| Horses | 1 | Head | | 1,000.00 | 1,000 |
| 1. Total Receipts | | | | | $50,772 |
| Total Receipts/Head[b] | | | | | 317.33 |

| Cash Costs | Total Costs | Cost/Head[b] |
|---|---|---|
| BLM-Desert Permit | $1,958 | $12.24 |
| Forest Permit | 1,283 | 8.02 |
| Pasture | 3,456 | 21.60 |
| Alfalfa Hay | 7,207 | 45.04 |
| Barley | 840 | 5.25 |
| Protein Block | 2,835 | 17,72 |
| Salt | 298 | 1.86 |
| Bloat Guard | 428 | 2.68 |
| Vet. & Medicine | 630 | 3.94 |
| Custom Hauling | 450 | 2.81 |
| Mach. Fuel, Lube, & Repair | 6,473 | 40,46 |
| Equipment Lube and Repair | 75 | 0.47 |
| Labor | 5,745 | 35.90 |
| Land Tax | 2,143 | 13.39 |
| Other Tax | 938 | 5.86 |
| Insurance | 138 | 0.86 |
| Interest on Operating Capital | 2,573 | 16.08 |
| 2. Total Cast Costs | $37,470 | 234.19 |
| Other Costs | | |
| 3. Depreciation | $4,613 | 28.83 |
| 4. Interest on Capital Investment | 14,155 | 88.47 |
| 5. Interest on Land Investment | 15,936 | 99.60 |
| 6. Total Other Costs (3+4+5) | 34,704 | 216.90 |
| Total All Costs (2+6) | 72,174 | 451.09 |
| 7. Net Cash Income (1-2) | 13,302 | 83.14 |
| 8. Net Ranch Income (7-3) | 8,689 | 54.31 |
| 9. Return to Land Investment (8-4) | -5,466 | -34.16 |
| Return to Operator (9-5) | -21,402 | -133.76 |

[a]1981 prices - Utah Crop and Livestock Reporting Service.

[b]Determined by dividing by herd size - 160 head.

## APPENDIX 3

TABLE 3

Large Cattle Ranch Base Situation

| Receipts | Quantity | Unit | Average Weight | Price/Cwt[a] | Total Value |
|---|---|---|---|---|---|
| Yearling Steers | 151 | Head | 600 | $84.75 | $76,784 |
| Yearling Heifers | 95 | Head | 550 | 74.62 | 38,989 |
| Cull Cows | 45 | Head | 950 | 45.38 | 19,400 |
| Cull Bulls | 6 | Head | 1,250 | 59.25 | 4,444 |
| Horses | 2 | Head | | 1,000.00 | 2,000 |
| 1. Total Receipts | | | | | $141,616 |
| Total Receipts/Head[b] | | | | | 329.34 |

| Cash Costs | Total Costs | Cost/Head[b] |
|---|---|---|
| BLM-Desert Permit | $4,498 | $10.46 |
| Forest Permit | 2,972 | 6.91 |
| Pasture | 12,016 | 27.94 |
| Alfalfa Hay | 22,234 | 51.71 |
| Barley | 2,258 | 5.25 |
| Salt | 803 | 1.87 |
| Protein Block | 5,355 | 12.45 |
| Bloat Guard | 1,151 | 2.68 |
| Vet. & Medicine | 1,698 | 3.95 |
| Custom Hauling | 500 | 1.40 |
| Mach. Fuel, Lube, & Repair | 10,841 | 25.21 |
| Equipment Lube and Repair | 116 | 0.27 |
| Labor | 11,654 | 27.10 |
| Land Tax | 5,724 | 13.31 |
| Other Tax | 2,012 | 4.68 |
| Insurance | 243 | 0.57 |
| Interest on Operating Capital | 6,410 | 14.91 |
| 2. Total Cast Costs | $90,585 | 210.67 |
| Other Costs | | |
| 3. Depreciation | $8,465 | 19.69 |
| 4. Interest on Capital Investment | 34,278 | 79.72 |
| 5. Interest on Land Investment | 43,320 | 100.74 |
| 6. Total Other Costs (3+4+5) | 86,063 | 200.15 |
| Total All Costs (2+6) | 176,648 | 410.82 |
| 7. Net Cash Income (1-2) | 51,031 | 118.67 |
| 8. Net Ranch Income (7-3) | 42,566 | 98.98 |
| 9. Return to Land Investment (8-4) | 8,288 | 19.26 |
| Return to Operator (9-5) | -35,032 | -81.48 |

[a]1981 prices - Utah Crop and Livestock Reporting Service.

[b]Determined by dividing by herd size - 430 head.

# LIST OF ABBREVIATIONS

ACEC: Area of Critical Environmental Concern
AMP: Allotment Management Plan
AUM: animal unit month
BEA: Bureau of Economic Analysis
BLM: Bureau of Land Management
CFR: Code of Federal Regulations
EA: Environmental Assessment
EIS: environmental impact statement
EPA: Environmental Protection Agency
F: Farenheit
FLPMA: Federal Land Policy and Management Act
FS: Forest Service
FWS: Fish and Wildlife Service
gal/yr: gallons per year
HCRS: Heritage and Conservation Recreation Service
HMP: Habitat Management Plan
IMP: Interim Management Policy
kg/ha: kilograms per hectare
lbs.: pounds
MFP: Management Framework Plan
ml: milliliters
NEPA: National Environmental Policy Act
NOx: nitrogen oxides
NRA: National Recreation Area
NRDC: Natural Resources Defense Council
NWPS: National Wilderness Preservation System
ORV: off-road vehicle
PAA: Planning Area Analysis
P.L.: Public Law
RPS: Rangeland Program Summary
SCS: Soil Conservation Service
$SO_2$: sulfur dioxide
SSF: soil surface factor
TSP: total suspended particulates
UDWR: Utah Division of Wildlife Resources
URA: Unit Resource Analysis
USDA: United States Department of Agriculture
USDC: United States Department of Commerce
USDI: United States Department of Interior
USGS: United States Geological Survey
VRM: visual resource management
WSA: Wilderness Study Areas

# GLOSSARY

ACRE-FOOT (ac. ft.). A volume of water that covers an area of 1 acre to a depth of 1 foot (43,560 cubic feet).

ACTIVE PREFERENCE. The total number of animal unit months of livestock grazing on public lands apportioned and attached to base property owned or controlled by a permittee or lessee that can be licensed. Active preference does not include suspended non-use.

ACTIVITY RECOMMENDATION (MFP STEP 1). A quantified statement, based upon an analysis of an activity objective, which clearly defines the specific course of action that will be taken to achieve all or part of the objectives.

ACTUAL USE. The use made of forage on any area by livestock and/or big game, usually expressed in animal unit months.

AERIE. Nest of eagles or other raptors built on a cliff or other high place.

ALLOTMENT (RANGE ALLOTMENT). A management area designated for the use of a prescribed number and kind of livestock under one plan of management. An area where one or more livestock permittees graze their livestock, consisting of public lands and any State and private lands that may be enclosed.

ALLOTMENT MANAGEMENT PLAN (AMP). A written program of livestock grazing management including supportive measures, if required. An AMP is designed to attain specific management goals in a grazing allotment and is prepared cooperatively with the permittee(s) or leasee(s).

ALTERNATIVE. One of at least two proposed means of accomplishing planning objectives.

AMBIENT AIR QUALITY. The quality of an air mass associated within a given environment.

ANALYSIS. The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

ANIMAL UNIT MONTH (AUM). The amount of forage required to sustain the equivalent of 1 cow or 6.2 sheep for 1 month; 5.8 deer for 1 month; 9.6 antelope for 1 month; 5.5 bighorn sheep for 1 month, or 2.2 burros for one month (usually 800 lbs. of useable air dried forage).

APPARENT TREND. An evaluation of the direction of change in range condition based on a one-time observation of the specific area as it relates to livestock and/or big game use.

AQUATIC. Living or growing in or on the water.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life/provide safety from natural hazards.

AVERAGE USE. The average actual use of forage (expressed in AUMs) by livestock and/or big game animals on an allotment during several representative years (usually the last 5 years).

BASIC VISUAL ELEMENTS. The elements which determine how the character of a landscape is perceived. *Form*: The shape of objects such as landforms or patterns in the landscape. *Line*: Perceivable linear changes in contrast resulting from abrupt differences in form, color, or texture. *Color*: The reflected light of different wave lengths that enables the eye to differentiate otherwise identical objects. *Texture*: The visual result of variation in the surface of an object.

CAPITAL VALUE. As applied to a BLM permit, the value of the permit as a part of ranch capital (e.g., land, machinery, stock, etc.). Changes in allocated AUMs can affect the overall capital value of ranch property. Any change in permitted use has the potential of affecting the livestock permittee's ability to secure a loan and the overall capital value of his property.

CHANGE AGENT. Any factor (person, physical force, living entity, chemical, etc.) which affects the primary characteristics of an ecological element, either positively or negatively.

CLASS OF LIVESTOCK. Age and/or sex groups of a kind of livestock.

CHAINING. The process of manipulating vegetation by pulling an anchor chain between two crawler tractors, thus reducing tall-growing, brittle vegetation and enhancing grasses and forbs.

COLIFORM. A general term for a group of bacteria found in the large intestine of man or animals. Its presence in water usually indicates fecal pollution.

COMPETITIVE FORAGE. Forage which deer, bison, or antelope use that can also be used by livestock.

CRUCIAL WILDLIFE HABITAT. That portion of wildlife habitat that is essential to the survival and perpetuation of a certain species in an area.

CUBIC FEET PER SECOND (cfs) (sec. ft.). As a rate of streamflow, a cubic foot of water passing a referenced section in one second of time. One cfs flowing for 24 hours will yield 1.983 acre-feet of water.

CULTURAL RESOURCES. Those resources of historical, archaeological, or paleontological significance.

ECOLOGICAL CONDITION. The present state of vegetation on a range site in relation to the climax (natural potential) plant community for that site.

ENDANGERED SPECIES. Any animal or plant species in danger of extinction throughout all or a significant portion of their range.

ENVIRONMENT. All that surrounds an organism and interacts with it.

ENVIRONMENTAL ANALYSIS. A systematic process for consideration of environmental factors in land management actions.

ENVIRONMENTAL ASSESSMENT (EA). A concise analysis of the probable environmental effects of proposed activities on Federal lands. The EA is used to determine if significant impacts are probable and preparation of an environmental impact statement (EIS) is necessary. If an EIS is not necessary, the EA identifies mitigation measures that would insure that any impacts from the proposed activities would not have significant adverse impacts on the environment.

ERODIBILITY. Susceptibility of a soil to erosion by water or wind. Relative terms are none, slight, moderate, and high.

EXCHANGE OF USE. An agreement made with a permittee having ownership or control of private lands interspersed and grazed in conjunction with surrounding Federal range. This agreement specifies the grazing capacity and gives BLM control of the non-Federal land for grazing purposes.

FORAGE. Vegetation of all forms available and of a type used for animal consumption.

FORB. A broad-leafed herb.

GENERA. Plural of genus, which is a group of related species.

GEOLOGIC EROSION. Erosion that occurs at rates which are controlled by the natural environment.

GRAZING CAPACITY. The maximum stocking rate possible without damaging vegetation or related resources. It may vary from year to year on some areas because of fluctuating forage production.

GRAZING CAPACITY (ESTIMATED). The number of animal unit months of forage available for grazing on a sustained yield basis on the public lands as determined through range studies/surveys. In this EIS, the soil-vegetation inventory and monitoring studies were used in estimating grazing capacity.

GRAZING PERMIT. A document authorizing livestock use of the public lands within grazing districts under provisions of Section 3 of the Taylor Grazing Act.

GRAZING SYSTEM. Grazing a range allotment having two or more pastures or management units to provide periodic rest for each unit.

HABITAT. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

HABITAT MANAGEMENT PLAN (HMP). A plan for a geographic area of public lands which identifies wildlife habitat management actions to be implemented to achieve specific objectives.

IMPACT ANALYSIS (MFP STEP 2). An analysis of the effects (negative and positive) of a Management Framework Plan Step 1 recommendation on other recommendations, social, economic, institutional, environmental, and other resource values. It is a portion of the multiple use analysis process.

INTERMITTENT STREAM. A stream which flows part of the time; usually after a rainstorm, during wet weather, or only part of the year.

KEY PLANT SPECIES. A plant that is a relatively or potentially abundant species. It should be able to endure moderately close grazing and serves as an indicator of changes occurring in the vegetational complex. Key plant species are important vegetation components that, if overutilized, will have a significant effect on watershed conditions, grazing capacity, or other resource values. More than one key plant species may be selected on an allotment. For example, one species may be important for watershed protection, and a different species may be important for livestock or wildlife forage.

LAND TREATMENT. Changing the characteristics of an established vegetation type for the purpose of improving rangeland forage resources. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods in the planning area alter the vegetation by chaining, spraying with herbicides, burning, and plowing, followed by seeding with well adapted desirable plant species.

LAND USE PLAN. A planning decision document which establishes resource allocations and coordinated objectives and constraints for all forms of public land and resource use within the area covered by the plan.

LICENSED USE. The number of AUMs purchased by a livestock permittee from the BLM on an annual basis. In this EIS, 5 years of licensed use have been averaged. The averaged numbers are those referred to in the text, tables, and graphs and are considered to be the present average use.

LITTER. A surface layer of organic debris consisting of freshly fallen or slightly decomposed organic material. Litter is important because it covers and protects the soil, reduces runoff rates, increases infiltration, and yields organic matter which improves soil fertility.

LIVESTOCK OR KIND OF LIVESTOCK. The species of domestic livestock—cattle, sheep, horses, burros, and goats.

LIVESTOCK PERMITTEE. A person or organization legally permitted to graze livestock on public lands.

MANAGEMENT FRAMEWORK PLAN (MFP). A land use plan for public lands administered by BLM which provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource.

MONITORING. The collection of data by a systematic and periodic examination of rangeland resources on specific areas by qualified individuals. The techniques or methods are designed to evaluate progress in meeting land use or allotment management planning objectives.

MONTANE. Pertaining to mountains.

MULTIPLE USE. Management of public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people. Relative values of the resources are considered, not necessarily the combination of uses that will give the greatest potential economic return or the greatest unit output.

MULTIPLE-USE ANALYSIS (MFP STEP 2). Includes impact analysis, determination of alternatives, and preparation of multiple use recommendations.

MULTIPLE-USE RECOMMENDATIONS. Program activity recommendations which have been modified by impact analysis or adjustments to resolve minor conflicts, or alternatives to the program activity recommendations developed to resolve conflicts, as a portion of MFP Step 2.

OBJECTIVES (MFP STEP 1). Management goals or quantified statements of desired end products (based on Planning Area Analysis projections of social, economic, and environmental values) which provide targets for program accomplishment.

OCULAR RECONNAISSANCE SURVEY. A range survey method which inventories vegetation by estimating total forage density, percent composition by species, and total useable forage within the various range types to determine the grazing capacity for livestock and big game (see range survey).

OFF-ROAD VEHICLE (ORV). Any motorized vehicle designed for or capable of cross-country travel over land, water, sand, snow, ice, marsh, swampland, or other terrain.

PASTURE (MANAGEMENT UNIT). A subdivision of a grazing allotment enclosed and separated from other units by fences and/or natural barriers.

PELLET GROUPS. A group of fecal material defecated by an animal (particularly big game) at one time.

PERENNIAL PLANT. A plant that has a life cycle of 3 or more years. Because of their longevity, it is desirable to base management on these species.

PERIOD OF USE. The times of the year that domestic livestock are allowed to graze on an allotment.

PERMEABILITY (SOIL). The ease with which gasses, liquids, or plant roots penetrate or pass through a layer of soil.

PERMIT. An authorization which allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: active preference (10 year) and temporary non-renewable (1 year).

PERMIT VALUE. BLM-allocated AUMs may be transferred from one permittee to another. The dollar value given by one permittee (buyer) to induce a present permit holder (seller) to transfer his permit is known as the "permit value" of an AUM. This "permit value" may have a significant bearing on the rancher's capital value.

PHASE, SOIL. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its use and management. A soil series, for example, may be divided into phases on the basis of differences in slope, stonieness, thickness, or some other characteristic that affects its use and management. These differences are too small to justify separate series.

PLANNING AREA. One or more planning units for which Management Framework Plans are prepared/revised.

PLANNING AREA ANALYSIS (PAA). The summary of data on social and economic conditions for a planning unit or area.

PLANNING UNIT. A geographic unit within a BLM district which includes related lands, resources, and use pressure problems which are considered together for resource inventory and planning.

PLANT COMPOSITION. The mixture of plant species found in a vegetation type or study area usually expressed in percents as related to all other plant species.

PLANT VIGOR. The relative well being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

PRIMITIVE RECREATION VALUES. Environmental features that enhance the quality of unconfined, undeveloped, and unmotorized recreation (i.e., hiking, backpacking, cross-country skiing, etc.). A general description would be scenic, undeveloped lands essentially removed from the effects of civilization with opportunities for solitude.

PRIOR STABLE LEVEL. A number derived from deer population dynamics data from the average of 10 or more years when deer populations were stable and at or near the grazing capacity of the range of a given deer herd unit.

PROPER USE FACTOR (PUF). The percent of the current year's growth of a forage plant that may be removed when the range is properly used. The proper use factor of any given plant species is dependent on (1) associated species; (2) kind of animals; (3)

period of use; (4) year; (5) past grazing use; and (6) animal preference.

PUBLIC LANDS. Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of the Interior through the BLM, except lands located on the Outer Continental Shelf and lands held for the benefit of Indians.

PUBLIC PARTICIPATION. The process of attaining citizen input into each stage of development of the Unit Resource Analysis and Management Framework Plan. It is required as a major input into the BLM's planning system.

RAIN SHADOW. A region of reduced rainfall to the lee of high mountains.

RANGELAND. Land that is dominated by vegetation that is useful for grazing and browsing by animals. "Range" and "rangeland" are used interchangeably, but the latter is preferred because it connotes a multiple-use concept, including fish and wildlife habitat, soil and water resources, livestock production, wild horse and burro habitat, and other public resource values associated with vegetation.

RANGELAND DEVELOPMENTS. Range facilities such as stockwater developments, fences, trails, etc., used to more effectively manage grazing.

RANGELAND IMPROVEMENTS. Any activity or program on or relating to rangelands which is designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include land treatments (i.e., chaining, seeding, burning, etc.), stockwater developments, fences, and trails to more effectively manage grazing.

RANGELAND SURVEY/STUDIES. An inventory of the range resources including production of plant materials, plant composition, range use, physical features, and natural conditions such as water, barriers, etc., for the purpose of estimating ecological conditions, trends in condition, estimated proper stocking rates, etc., useful to management planning.

RAPTORS. Birds of prey such as the eagle, hawk, owl, or vulture.

REDUCTION. Placing a portion of a grazing preference in suspended status because the currently authorized use exceeds the available grazing capacity.

REGION. May be any geographic area larger than a planning area (Social-Economic Profile Area, sub-State, State, multi-State, or National), which is appropriate for comparative area analysis and for which information is available. Regions may be different for different resources or subject matter analysis.

RESEEDING SUCCESS. Rating of soils as to percent probability of success for rangeland seeding. A relative rating of successful seeding establishments that might be expected during a given period of years.

RESOURCE AREA. A manageable geographic subdivision of a district consisting of one or more planning areas.

RESOURCES. All of the products and physical values produced or contained within public lands. They include the values which are known as natural resources (i.e., timber, coal, oil, etc).

RIPARIAN VEGETATION. Vegetation growing near streams, reservoirs, ponds, etc. (permanent or intermittent). It is usually unique or limited in arid regions and is, therefore, of great importnce to a wide variety of wildlife.

RIPARIAN HABITAT. The native environment supporting plants that are adapted to moist growing conditions found along waterways, ponds and generally moist-growing conditions.

SEASON-LONG GRAZING. Grazing a range allotment or management unit (pasture) continuously for a specified period of time (i.e., June 15-September 30).

SEDIMENT YIELD. The amount of mineral or organic soil material that is in suspension, is being transported, or has been moved from its site of origin.

SENSITIVE SPECIES. Species not yet officially listed but which are undergoing status review for listing on the official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

SHRUB. A plant that has a persistent, woody stem, a relatively low growth habit, and generally produces several basal shoots instead of a single trunk.

SOIL ASSOCIATION. A group of defined and named soil units occurring together in individual and characteristic patterns over a geographic region.

SOIL CLASSIFICATION. The systematic arrangement of soils into classes in one or more categories or levels of classification for a specific objective. Broad groupings are made on the basis of general characteristics and subdivisions on the basis of more detailed differences in specific properties.

SOIL SURFACE FACTOR. A numerical expression of surface erosion activity caused by wind and water as reflected by soil movement, surface litter, erosion pavement, pedastalling, rills, flow patterns, and gullies. Values may vary from 0 for no erosion to 100 for severe erosion conditions.

SOIL-VEGETATION INVENTORY. A uniform, systematic method for inventory of soil and vegetation resources and collecting data for use in planning and environmental assessments. Earth Environmental Consultants, Inc., conducted an inventory of the planning area in 1980. (Also, see range survey.)

STATE LANDS. Land controlled or administered by one of the individual United States.

STOCKING. The degree to which an allotment is stocked with livestock and big game, usually expressed in AUMs.

SUSPENDED PREFERENCE. That portion of the recognized grazing preference which is placed in a suspended category because the preference exceeds the present available livestock grazing capacity.

SUSPENSION. Temporarily withholding, in whole or in part, grazing use authorized under a grazing permit, lease, or other grazing use authorization.

TAXA. Any taxonomic unit, as an order, genus, variety, etc.

THREATENED SPECIES. Any animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

TREND IN RANGE CONDITION. An interpretation of the direction of change in range condition based on multiple observations over a long period of time.

UNALLOTTED LANDS. Those lands not allocated to a specific use (i.e., livestock grazing).

UNIT RESOURCE ANALYSIS (URA). A compilation of physical resource data and an analysis of the current use, production, condition, and trend of the resource and the potentials and opportunities within a planning unit or area, including a profile of ecological values.

VEGETATION. All living plant matter.

VEGETATION UTILIZATION. The proportion of the current year's forage production that is consumed or destroyed by grazing animals. This may refer either to a single species or to the whole vegetation complex. Utilization is expressed as a percent by weight, height, or numbers within reach of the grazing animal.

VISUAL RESOURCE MANAGEMENT (VRM) SYSTEM. Classification containing specific objectives for maintaining or enhancing visual resources, including the kinds of structures and modifications acceptable to meet established visual goals.

WETLANDS. Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds.

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